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Volume 29

February 17, 1976

Transcript of Proceedings

Pages 5014–5402

INDEX

Colstrip 3 & 4 — Page

WITNESSES

February 17, 1976, Tuesday 5014

MARK J. RICKER

- Written Direct Statement 5016
- Cross, by Department of Natural Resources and Conservation 5018
- Cross, by Northern Cheyenne Tribe, Inc. 5023

K. R. SHAH

- Written Direct Statement 5024
- Cross, by Applicants 5069

JOHN J. GREYTAK

- Oral Statement 5104
- Cross, by Department of Natural Resources and Conservation 5108

ROD HANSEN

- Written Direct Statement 5112
- Cross, by Department of Natural Resources and Conservation 5117

K. R. SHAH (Resumed)

- Cross, by Applicants (continuing) 5122

ARNOLD COGAN

- Written Direct Statement 5164
- Cross, by Applicants 5209
- Redirect, by Department of Natural Resources and Conservation 5269
- Re-cross, by Applicants 5273

RONALD H. WILKERSON

- Written Direct Statement 5276

I N D E X

Colstrip 3 & 4 — Page

WITNESSES

February 17, 1976, Tuesday (continuing)

RONALD H. WILKERSON (continuing)
- Cross, by Department of Natural Resources and Conservation 5288
- Cross, by Northern Plains Resource Council 5298

WILLIAM BERBERET
- Written Direct Statement 5321
- Cross, by Department of Natural Resources and Conservation 5324

K. R. SHAH (Resumed)
- Cross, by Applicants (continuing) 5330
- Redirect, by Department of Natural Resources and Conservation 5349
- Re-cross, by Applicants 5355

LESLIE E. COATES
- Direct, by Applicants 5357
- Cross, by Northern Plains Resource Council 5363
- Redirect, by Applicants 5366

THOMAS M. FRANCE
- Direct, by Applicants 5367
- Cross, by Northern Plains Resource Council 5381
- Voir Dire, by Applicants 5384
- Cross, by Northern Plains Resource Council (continuing) 5386
- Redirect, by Applicants 5390
- Re-cross, by Northern Plains Resource Council .. 5392

Procedural 5393

TUESDAY, FEBRUARY 17, 1976

The hearing reconvened at 8:35 A.M. on Tuesday, February 17, 1976, in the Chambers of the Montana House of Representatives, State Capitol, Helena, Montana.

The Honorable Carl M. Davis, Hearings Examiner, presided over the proceedings.

APPEARANCES:

Applicants:

William M. Bellingham, Esq.
John L. Peterson, Esq.
John Ross, Esq.

Department of Natural Resources and Conservation:

Arden E. Shenker, Esq.
Donald MacIntyre, Esq.
Ted J. Doney, Esq.

Northern Cheyenne Tribe, Inc.

Peter Michael Meloy

The following proceedings were had:

HEARINGS EXAMINER: Mr. Ricker?

MR. PETERSON: Mr. Davis, I have another matter while that man is coming forward. Back in August of '75, we made a request from the Department of Natural Resources for an up to date general ledger sheet of the expenditures for Colstrip No. 3 and 4 on the filing fee, similar to the one marked Applicants' Exhibit 142, and at that time, counsel for the DNR advised us that they would supply that ledger sheet. We have not yet received it and we would appreciate it if that would be supplied.

MR. SHENKER: It was my understanding that it was supplied, but I'll talk to Dr. Tsao at the first opportunity and see what has happened to it.

MR. PETERSON: Very well, thank you.

MARK J. RICKER, appearing as a public witness, having been first duly sworn upon his oath, both as to his written direct testimony and as to the oral testimony to follow, was examined and testified as follows:

(THE WRITTEN DIRECT TESTIMONY OF MARK J. RICKER WAS DIRECTED TO BE INSERTED AT THIS POINT.)

[illegible]
[illegible]
[illegible]

MARK J. Ricker

January 8, 1976

HELENA CHAMBER OF COMMERCE POSITION STATEMENT ON THE CONSTRUCTION OF COLSTRIP 3 & 4 AND THE ACCOMPANYING 550 KV TRANSMISSION LINES

After careful review and consideration, Helena Chamber of Commerce directors by unanimous vote on two occasions, pledged their full support of the proposed Colstrip 3 and 4 generating plants and the associated Colstrip - Hot Springs 500 KV transmission lines. These actions were taken on November 18, 1974 and again on January 6, 1976.

Montana is deficient in present and future electric generating capacity for its people and its economic and environmental needs. Construction of Colstrip 3 and 4 is the only sensible way to provide those Montana needs, since 40% will be immediately available for Montana. More and more of this electricity will be available for these needs as the years go on. Only through adequate and reliable energy supplies can Montana be a healthy, viable state with the ability to take care of the needs of the people. We now have that opportunity, through an arrangement to have other electric companies help substantially by investing in Montana. Why plan a shortage when we have the complete ability to avoid it?

Power will be available at a lower cost to all of the people and enterprises in the Helena and Western Montana area, because of reduction of cost made possible by construction and operation of large scale projects as compared with smaller ones. The estimate of savings to Montana Power customers is five million dollars each year - certainly a significant benefit in this period of high inflation.

As you know, unemployment is high in Montana and getting worse at a frightening rate. We are in a time of critical need to provide jobs for Montana's working people. Construction of the plants and lines will provide 400 skilled good paying permanent jobs for Montana people. These jobs are in addition to as many as 1,800 construction jobs which will be active over a number of years.

State of Montana government, County government and our fine educational systems are always pressed for adequate funds to meet their responsibilities. Colstrip 3 & 4 facilities and associated 500 KV lines will provide 11 million dollars additional taxes in the state at present tax levels. A major portion of this tax revenue will be paid by the other partners in the project, thus bringing Montana tremendous tax revenues from other states - a great step in Montana's "Balance of Payments".

All this can be accomplished in a manner which meets and exceeds all of the stringent Federal and State regulations pertaining to all environmental pollution and reclamation matters.

We feel Colstrip 3 and 4 and related 500 KV transmission lines must proceed as soon as possible. Therefore, the Helena Chamber of Commerce is asking for positive action on this extremely important project for the future benefit of Montana.

Sincerely,

Mark J. Ricker
Executive Director

MJR/hbm

HEARINGS EXAMINER: I've explained that since you have a written statement, there's no benefit to be derived by anyone by your reading it again, so Mr. Shenker, of the Department of Natural Resources, counsel, will ask you some questions on your statement.

EXAMINATION OF MARK J. RICKER

Cross, by Department of Natural Resources and Conservation

By Mr. Shenker:

Q Do you live in Helena, Mr. Ricker?

A Yes, I do, sir.

Q How long have you been Executive Director of the Helena Chamber of Commerce?

A Oh, approximately five weeks.

Q What did you do before that?

A I worked for Sun Newspapers in St. Paul and Minneapolis, Minnesota.

Q How long have you lived in Montana?

A Five weeks.

Q Then when you tell us of any action taken by the board of the Helena Chamber of Commerce on November 18, 1974, that's history, as far as you're concerned?

A That's correct.

Q Were you here when they took action on January 6, 1976?

A Yes, I was.

Q You'd just arrived that week?

A Correct.

Q When the Helena Chamber of Commerce took action, did it do so by canvassing the members for a vote?

A The action was taken by the Board of Directors.

Q Were the members ever canvassed for a vote?

A Not directly in terms of a formal questionnaire, et cetera, but I'm sure the membership had an opportunity to express their feelings to the Board in verbal fashion, as opposed to a questionnaire.

Q I suppose the board members would listen if someone expressed something to them, but did the Chamber ever solicit the views of the members in any kind of plebiscite of any form?

A Just verbally, but in terms to answer your question did we, or did we not, send out a questionnaire or a survey to ask our members as to where they stood on the question of Colstrip 3 and 4, we did not do that.

Q No survey, no questionnaire, no ballot, no formal voting process?

A All that I can say is that from the time that I came in office and we took the action on January 6th, I was not aware of any formal questionnaire or survey.

Q Well, your review of the records as of the November 18, 1974 action, that, I suppose, would have told you whether there had been some formal vote taken?

A I would hope so.

Q November 18, 1974 is an interesting date, Mr. Ricker. Do you know when the Department of Natural Resources and Conservation issued its environmental impact statement in draft form?

A I'm sorry, I didn't get that question.

Q Do you know when the Department of Natural Resources and

Conservation issued its environmental impact statement in draft form?

A No.

Q It was three days after this resolution by the Helena Chamber of Commerce first was passed in support of the proposed Colstrip units 3 and 4. That would have been November 21, 1974. Do you know, sir, whether there was any reason for the proximity between the two dates?

A Again, I can't address myself to anything that might have happened before I came on board with the Chamber of Commerce. I can only testify from the time that I took over.

Q Do you know whether, at the meeting on January 6, 1976, any new information was submitted to the board that was not before it when it made its first resolution?

A Not to my knowledge.

Q Then, of course, the Board of the Helena Chamber of Commerce would not have had any of the information provided in the environmental impact statement of the Department of Natural Resources and Conservation, would it?

A Well, based on what you said, that the impact statement came out after our resolution, that would be correct.

Q The statement that you have rendered here, sir, I take it, is something that is your personal expression on behalf of the Helena Chamber of Commerce, is that correct?

A That's correct.

Q How do you know, when you say as you do in the first sentence of the second paragraph of your statement that "Montana is deficient in present and future electric generating capacity for its people"?

A That's just based on information provided to us by various sources, namely, the Montana Power Company, our various industries who are on the Chamber of Commerce, labor unions, et cetera.

Q And similarly, the question that you ask at the end of that paragraph, is "Why plan a shortage when we have the complete ability to avoid it? " I suppose that you would ask the question differently if there were no shortage, wouldn't you?

A Correct.

Q Indeed, if there were no shortage, then your Chamber would not be supporting Colstrip 3 and 4, would it?

A I don't know about that. Again, I cannot answer for the board. I'm just here to answer questions relative to this letter, but I cannot answer for the board.

Q Was it your understanding that the letter expression of opinion by the Helena Chamber of Commerce favors Colstrip units 3 and 4 whether they are needed or not?

A Would you say that again, sir?

Q It is your understanding that the letter expression of opinion by the Board of the Helena Chamber of Commerce favors Colstrip units 3 and 4 whether they are needed or not?

A No, I think they favor it based on the proposed energy shortage and that there is a proven need for the construction of these facilities.

Q Then if there is no proven need or if there is no energy shortage, then the Chamber would not favor Colstrip 3 and 4 would follow logically, wouldn't it?

A That's correct.

Q The Chamber, of course, is also in favor of providing jobs for Montanans, and I take it the position of the Chamber would be that it would be in favor of providing the maximum number of jobs irrespective of the source, would it not?

A That's correct.

Q How did you get the figures that are in your statement that Montana Power Company customers would save $5,000,000 a year with Colstrip 3 and 4 and the facilities would provide an additional $11,000,000 a year at state tax levels?

A Information furnished us by the Montana Power Company.

Q Who was your contact at the Montana Power Company?

A Locally? Bill Headapohl.

Q Was there any other contact from the Montana Power Company?

A No, not to my knowledge.

Q Your statement, in its next to the last paragraph, Mr. Ricker, seems to take pride in the fact that the proposed Colstrip units should at least meet the federal and state regulations that pertain to all of the environmental matters that involve Colstrip. I read that correctly, don't I?

A That's correct.

Q You would include, would you not, within the environmental concerns on the Colstrip project, all of the provisions of the Montana Utilities Siting Act?

A At the time this letter was drafted, I think the board addressed itself mainly to the Clean Air and Water Act, and was not aware of the siting provisions.

MR. SHENKER: I have nothing further. Thank you, Mr. Ricker.

HEARINGS EXAMINER: Do you have any questions, Mr. Meloy?

Cross, by Northern Cheyenne Tribe, Inc.

By Mr. Meloy:

Q Who is the immediate past President of the Helena Chamber?

A You mean the 1975 President?

Q Yes.

A That was Mr. Headapohl.

MR. MELOY: Thank you. No other questions, Mr. Davis.

HEARINGS EXAMINER: Very well, thank you for coming, sir, and you're excused, and your testimony will be made a part of the record in today's proceedings.

(WITNESS EXCUSED.)

HEARINGS EXAMINER: Your next witness, sir?

MR. SHENKER: The Department will call this morning Dr. Kanu R. Shah.

DR. K. R. SHAH, called as a witness by the Department of Natural Resources and Conservation, having been first duly sworn upon his oath, both as to his written direct testimony and as to the oral testimony to follow, was examined and testified as follows:

(THE WRITTEN DIRECT TESTIMONY OF DR. K. R. SHAH WAS DIRECTED TO BE INSERTED AT THIS POINT.)

STATEMENT OF TESTIMONY OF DR. K. R. SHAH

In January 1975, Commonwealth Associates Inc (CAI) was retained by Montana State Department of Natural Resources and Conservation through their legal counsel Tooze, Kerr, Peterson, Marshall and Shenker. CAI undertook such studies necessary to provide an independent and objective analysis. Based upon those studies, in this testimony, I am requested to address the following:

> Objective evaluations of the load forecasts and resource analysis of the applicant companies (Montana Power Company, Washington Water power Company, Puget Sound Power and Light Company, Portland General Electric Company and Pacific Power and Light Company) and the Energy Planning Division of the Montana State Department of Natural Resources and Conservation and, secondly, discuss various available practical options.

Before I discuss the method of analysis, the results of load forecast and resource analysis, and the various available practical options, I would like to briefly summarize the qualifications and experience of CAI and myself in undertaking this evaluation.

QUALIFICATIONS AND EXPERIENCE

Commonwealth Associates Inc (CAI) with its parent company Gilbert Associates Inc (GAI) is the largest Architectural and Engineering Company in the USA. The company has approximately 3,700 employees of which about 1,300 are located in Jackson, Michigan. Approximately 70% of these employees are in technical and professional classifications. The company (GAI/CAI) has offices in New York, Washington, D.C. and a number of foreign countries - Turkey, Bangladesh, Taiwan, Iran, Brazil and others .... In recent years GAI/CAI has performed similar studies for many electric utilities having diverse load and economic characteristics, for example, Central Power and Light Company, Boston Edison Company, Columbus and Southern Ohio Electric Company, United Power Association, Southwestern Electric Power Company etc ....

I joined Commonwealth Associates Inc in January 1973 as Principal Engineer and was promoted to Staff Engineer in 1975. I graduated from University of Baroda, India with a Bachelor of Engineering Degree in 1961, Gujarat University with a Master of Engineering in Electric Machines Design in 1963, University of Missouri at Rolla with a degree of MSEE in 1965 and University of Missouri at Columbia with a PhD in Electrical Engineering in 1969. I have taught electrical engineering at VMI, Virginia Polytechnic Institute and University of Missouri. I have worked with an electrical machines manufacturer, Hughes Research Laboratories, and

Baltimore Gas and Electric Company and Los Angeles Department of Water and Power as an independent consultant. I am a Senior Member of the Institute of Electrical and Electronics Engineers. I have authored/coauthored more than 30 technical articles in power systems area.

Since 1969 I have been involved in Load Forecasting. From 1969 to 1971, I was working with Baltimore Gas and Electric Company and a number of my graduate students at Virginia Polytechnic Institute on new methods of forecasting short, intermediate, and long term load forecasts. The major thrust of our research work was to identify parameters affecting electric load demand and incorporate them into a workable load forecasting program. Since joining CAI in 1973, I have been consulting with many power companies - either directly or through GAI/CAI load forecasters and resource planners on load forecasting and generating planning.

For this project, which is the basis of my current study, I assembled a project team consisting of economists, electrical engineers and operation research specialists. The following work is the effort of this project team carried out under my supervision, direction and control.

METHOD OF ANALYSIS

The evaluation of "public needs" of any proposed electric generating facilities requires (i) determination of future electric load growths in an area served by the proposing electric utility by developing suitable load forecasts, (ii) analysis of present and planned generation resources of the proposing electric utility and (iii) load-resource analysis to project a need for additional generation capacity by considering load growths, generation resources and appropriate reserve requirements of the proposing electric utility.

The project - "Colstrip Electric Generating Units 3 and 4, 500 kV Transmission Lines and Associated Facilities" - has been jointly proposed and financed by five different electric utilities which serve seven different states with a lead role from Montana Power Company. Because of this, I will discuss, for review of the Board of Resources and Conservation the following two scenarios:

1. All five of the applicant companies acting as "one company", planning appropriate generation resources to meet their projected load demands and appropriate generation reserve from the years 1975-1976 to 1984-1985 and
2. Montana Power Company planning appropriate generation resources to meet its projected load demands and appropriate generation reserve from the years

1975-1976 to 1984-1985.

Thus, in this analysis, we will evaluate load forecasts and resources of each of the applicant companies, and develop two different load-resource analyses: (i) five companies acting as "one" and (ii) Montana Power Company. Also the load forecasts made by the Energy Planning Division, Montana State Department of Natural Resources and Conservation (DNR) will be evaluated.

However, before I discuss these, a common basis of understanding of what is load forecast and what is resource analysis must be clearly defined.

Load Forecast

Webster defines the infinitive verb "forecast" as:

> "to calculate or predict (some future event or condition) usually as a result of rational study and analysis of available pertinent data"

"Load Forecast" is thus a systematic process for predicting the load growth based on the analysis of the available pertinent data. Load forecasting is a process in which various significant factors, such as economic, demographic and climatic, affecting the past load growth are determined by analyzing available pertinent data. Average and peak load demand of forecasts of applicant companies and Montana State

DNR are evaluated here by using this definition. Peak and average load demands, as used in this testimony, are defined as follows:

- Peak load demand in MW is the maximum hourly load in a given year
- Average load demand in MW is the ratio of the total energy consumed in a year to the total number of hours (8760) in a year.

Resource

"Resource" is defined as an available supply that can be drawn upon when needed. Energy resources of an electric utility at any time therefore consist of a combination of firm generation and contractual electrical energy interchanges with neighboring electric utility(ies) or power pool(s) available at that time.

GENERAL APPROACH

In order to obtain better understanding of the load forecasts and resources and data used in forecasting and resource analysis by each of the applicant companies, I personally visited each of the applicant companies during the period February 26 to March 13, 1975. Representatives of each of the applicant companies were very cooperative in explaining their approach and supplying the data they used in load forecasting and resource analysis. In those cases where the required data either could not be readily located or had changed due to unforeseen circumstances beyond their control, they made every effort to supply the data at a later date. The load and resource data requested from each of the applicant companies is outlined in Exhibit 200.

In this analysis we used the data supplied by each of the applicant companies in determining our evaluation of the energy growth rates of various classes of customers served by the companies, and no attempt was made to check the validity of the past historical data. However, in those cases where we felt the lack of a company's justifications for projection of certain data for future years, or when we felt the affect of a lack of uniformity of the company's procedure we attempted to quantify those factors using the best information available. Sometimes ranges of values were selected.

Load Forecasting

A load forecasting study should consider various factors (from 1 to 18 in Exhibit 200) and incorporate them in the load forecasting methodologies if evaluation of these factors clearly established an impact on future energy consumption.

We feel that "energy conservation", "price-elasticity" and "cross-elasticity" will impact energy consumption patterns of each class of customers. However, because of the lack of any definitive study in the service territories served by the applicant companies, we have not included the effects of these factors in load forecast estimates.

Also, estimation of temperature sensitive loads by analyzing weather conditions was not undertaken due to the lack of weather data supplied to us in various areas of the company's service territory.

Our load forecast analyses will use the available past historical data from applicant companies and project the behavior of the factors affecting load growth based on our experience and analysis.

Resource Evaluation

The data on existing and planned generating resources and contractual commitments was obtained from each of the applicant companies for the 1974-1985 period.

Some of the applicant companies were using different procedures and operating availability factors for computing available system generation. This practice may be defensible for existing generation but is open to question for future planned generation. Because of this, in order to maintain uniformity, we have used power industries' past experience in computing available generation resources of each of the applicant companies, to meet average and peak load demands. Operating availability in a year is defined as follows:

$$\text{Operating Availability} = \frac{\text{Available Hours}}{(\text{Available Hours})+(\text{Forced outage} + \text{Scheduled outage})}$$

Assumptions

In this study, following assumptions were made:

1. Data supplied by companies from February, 1975 to May, 1975 were correct.
2. Future anticipated industrial load as supplied by each of the applicant companies was correct.
3. Coincidence factor is unity. Coincidence factor is defined as the ratio of the coincident maximum peak load of the total system to the sum of the peak loads of the members of the system.
4. Generation resources given by applicant companies were correct.
5. The ratings and scheduled "on-line" dates of each of the generating units and expiration of existing contracts were correct.

LOAD FORECASTS OF APPLICANT COMPANIES

In this section, discussion of load forecasts made by each of the applicant companies and CAI's evaluation of these load forecasts is given.

MONTANA POWER COMPANY FORECASTS

On February 26, 1975, I visisted Mr. R. Hofacker, Vice-President of Montana Power Company to gain better understanding of the load forecasting methodologies used by Montana Power Company.

Montana Power Company Methodology

Briefly, average load (Montana Power Company defines this load as Energy Load) in MW is estimated by using the following procedure:

1. Develop base load estimates.
   First, the base load data are developed by removing the widely fluctuating Anaconda Company load from the total average load for the years 1952-1971. An equation, using regression analysis to best fit these base load data points, is obtained. This correlation equation is used to project future base load demands.
2. Block loads consisting of Anaconda Company load and future major industrial loads are estimated separately, either by contacting Anaconda directly or

from requests received for existing or planned industrial expansions. This block load is revised continuously as new information becomes available.

3. Average load estimates are then developed by adding base load estimates from (1) above and block load estimates from (2) above.

Peak load demand in MW is then developed by dividing average load in MW with load factor obtained from past experience.

The load forecast methodology used by Montana Power Company appeared to be reasonable in the past. However, we feel that there is no assurance that this method will estimate future base loads accurately because of the injection of new factors such as cross-elasticity, price elasticity, energy conservation, load management and pollution controls. The reason for our skepticism is that the accuracy of the base load estimates is based on the accuracy of a single correlation equation which identifies only the total system base load without breaking it into its components and sub-components to help us visualize the effects of the future.

In order to review Montana Power Company's average load forecasts, we used two different methods. The first was a "Base Load" Forecast method to verify MPCo's estimates and the second method - "Energy Forecast" - was used to check the forecast made by the first method.

Base Load Forecast Method

This method is similar to the method currently being used by Montana Power Company. In this method, average load demand in MW is developed by combining base load forecasts and large industrial load forecasts.

In order to develop base load forecasts, we used base load data from 1952 to 1974 as supplied by Montana Power Company. Many correlation equations - either exponential or second degree polynomial - to best fit the base load data points were sought and standard error of estimates of each of these correlation equations was calculated. A second degree polynomial giving the minimum standard error of estimate was selected as:

$$y = 140.65 + 4.36587\,x + 0.40947\,x^2$$

where y = base load in MW

X = Year - 1951

This base load forecast is given in Exhibit 201.

The forecast for large industrial load, as given in Exhibit 201, is made by reviewing the requests from many industries and company's past industrial load growth pattern.

The average load forecast as given in Exhibit 201 is then the sum of base load forecast and large industrial load forecast. The operating year load forecast as given in Exhibit 213 is obtained by averaging yearly loads. For example, operating year 1975-76 average load forecast is obtained by taking a sum of 1975 and 1976 average loads and dividing this sum by 2. Peak load demands as given in Exhibit 212 are obtained by using load factors used by the company.

Energy Forecast Method

In this method, average load demand is obtained from total energy sales in MKWHR (MKWHR = KWHR x 10^6) after correcting for system losses.

$$\text{Total Energy Sales} \overset{\Delta}{=} \text{Base load Energy Sales} + \text{Block Load Energy Sales}$$

where $\text{Base Load Energy Sales} \overset{\Delta}{=} Y_R + Y_C + Y_{ILA} + Y_{GM} + Y_{REA} + Y_{IS} + Y_{ID}$

Y_R = Residential Energy Sales in KWHR

Y_C = Commercial Energy Sales in KWHR

Y_{ILA} = Energy Sales to Industrial Less Anaconda in KWHR

Y_{GM} = Energy Sales to Government and Municipals in KWHR

Y_{REA} = Energy Sales to REA in KWHR

Base load energy sale was divided into various components and each of these components were forecasted separately using the energy sales data supplied by the company. Regression analysis was used to best fit the past data of each of the components from 1964-1973. The following correlation equations were used to forecast residential, commercial, industrial (less Anaconda), government and municipals, US Indiana service and interdepartmental electric energy sales:

$$Y_R = \left[4368.92 + (203.359)x\right] \text{ x Number of Residential customers}$$

$$Y_C = \left[23{,}048.7 + (1{,}564.51)\ x\right] \text{ x Number of Commercial customers}$$

$$Y_{ILA} = \frac{1}{2}\left[\{(0.4787776 \text{ x } 10^6)\ (1.09409)\}^x + 405{,}168 + 75{,}129.4\ x\right]$$

$$Y_{GM} = 116{,}728 + 1{,}460.4\ x$$

$$Y_{REA} = \frac{1}{2}\left[(181{,}225)(1.008164)^x + 182{,}521 + 1{,}581.20\ x\right]$$

The base for number of customers was obtained from past data while their projection was based on a population increase of 8.2% from 1974 to 1984 as given by 1974, US Department of Commerce, 1984 Estimate by USN & WR Economic Unit. The future projection of Energy Sales to US Indian Service and Interdepartmental use was supplied by the company. The forecasted energy sales by class of customers is given in Exhibit 202.

The base load energy sale thus obtained was corrected for losses and base load in MW was obtained as:

$$\text{Base Load in MW} = \frac{(\text{Base Load Energy Sales}) \times 1.1249}{8760}$$

Block load energy sales consist of energy sales to large industrial customers such as Anaconda. This block load component is the same as given in Exhibit 201. Exhibit 202 gives average load in MW obtained by adding base load and block load components.

A comparison of the results of these two methods, as given in Exhibits 201 and 202, show that difference between them is small.

PORTLAND GENERAL ELECTRIC COMPANY FORECASTS

On March 13, 1975, I visited Mr. G. Bredemeier, Vice-President of Portland General Electric Company (PGE) in Portland, Oregon to gain better understanding of the load forecasting methodologies used by the company and to acquire data relating to PGE's electric growth to enable us to make our own evaluation. I received excellent cooperation from representatives of this company. Briefly, Portland General Electric Company utilizes annual energy sales as the basis of their forecast, annual energy sales then are subdivided into its three major components - residential, large industrial and "all others" - and these components are projected separately using detailed demographic analysis, new customer connections, energy consumption patterns and marketing analysis. The total annual energy sales thus obtained is corrected for system losses to obtain average load in MW. Peak load in MW is then projected by applying load factors obtained from past historical data. PGE's load forecast is consistent with generally accepted approaches used by utilities around the country. The company has made more detailed analysis on population projections, a key ingredient in projecting future load demands. However, they have generally assumed that future load growths after 1975 will continue at the rate projected in 1973 and that the energy crunch and economic recession of 1973 and 1974 are temporary fluctuations in the trend curve.

Our evaluation of PGE load forecasts follows:

We subdivided total energy sales into the major components and projected each of these components using past historical data on population, number of customers, effective buying income (EBI) per household, Gross National Product (GNP) and industrial growth with new possible accounts as:

$$Y = Y_R + Y_{GS} + Y_{LI} + Y_{HI} + Y_{SL} + Y_{UC} + \text{Losses}$$

where Y_R = Energy Sales to residential customers in MKWHR

Y_{GS} = Energy Sales to General Services in MKWHR

Y_{LI} = Sales to light industries in MKWHR

Y_{HI} = Sales to heavy industries with new accounts in MKWHR

Y_{SL} = Sales for street lighting in MKWHR

Y_{UC} = Sales to ultimate customers obtained from PGE in MKWHR

PGE considers system losses as 10% of energy sales to all the customers.

Resident energy forecast (Y_R) was developed as:

$$Y_R = (\text{residential KWHR}/_{\text{customer}}) \times \text{number of customers}$$

$$\text{where } \log Y_{RC} = \log(\text{residential KWHR}/_{\text{customer}}) =$$

$$3.47676 + (.00005)(\text{EBI}/_{\text{household customer}})$$

Effective Buying Income (EBI) per household customer is obtained from 1962-1973 data of Sales Management Survey of Buying Power of Multnomah, Clarkamas, Washington, Marion, Yamhill, Polk and Columbia counties served by PGE. EBI/household customers was obtained from expected changes in personal income projections.

The projection for the number of customers in PGE area was developed from the population projections given by PGE and historical trend of number of people per customer. We have estimated 2.75 people per customer for this analysis.

General service energy forecast was developed by determining regression analysis between total retail sales and energy consumption in KWHR. Total retail sales were obtained upon analysis of the ratio of total retail sales to total EBI over 1962-1973 period. A second degree polynomial as given below was used:

$$Y_{GS} = -1241.3 + 862.4\ x + 75.1\ x^{2}$$

Light Industrial Sales forecast was obtained by developing correlation equation of energy sales to GNP as:

$$Y_{LI} = 2127.1 - 4.25211\ (GNP) + 0.00254\ (GNP)^{2}$$

Heavy industrial sales forecast is developed by using the following regression analysis:

$$Y_{HI} = 634.999 + 31.06\ x + 4.86949\ x^{2}$$

where $X = (\text{Year}-1959)$

Heavy industrial loads include huge growth expected in 1976-1980 by PGE.

Street light energy forecast Y_{SL} is:

$$Y_{SL} = 52.15479 + 1.45842\ x + 0.09546\ x^{2}$$

Exhibit 203 gives the energy forecasts of each of the above components. Total energy forecast after accounting for system losses is converted in MW to obtain average power for operating years up to 1985-1986. Peak load demands in MW are determined in Exhibit 203 using load factors used by PGE.

PUGET SOUND POWER & LIGHT COMPANY LOAD FORECASTS

On March 11, 1975, I visited Mr. D. H. Knight, Vice-President of Puget Sound Power & Light Company, at their Bellevue office, to gain better understanding of their load forecasting methodologies and to obtain relevant data for our evaluation of Puget Sound Power & Light Company's (PSP&LC) forecasts. Briefly, PSP&LC uses total energy as the basis of their forecast and develops two correlation equations - second degree polynomial and exponential - using regression analysis to establish lower and upper bounds for long term average load forecasts. They claim that the final load forecast is made within these two bounds by taking into account trends in population, and customer growth, anticipated space and electric water heating, saturation changes, commercial trends, customer energy consumption trends and trends in electrical use applications. Using the polynomial and exponential equations used by PSP&LC to estimate energy growth lower and upper bounds and the "Twelve Year Forecast - Annual Billed KWH" as given by PSP&LC, we notice that energy estimates for 1974, 1975 and 1976 of PSP&LC are lower than the range of values derived by using polynomial and exponential equations. For example, using equations used by PSP&LC net energy sales in 1974 should lie between 10,762 and 10,634 MKWH. However, PSP&LC has used 10,278 MKWH for estimating purposes. Also we feel that PSP&LC's projection of number of customers is high but energy consumption per customer is low.

Our load forecast analysis follows. As before, we have estimated total system energy as the sum of residential, commercial, street lighting and highway lighting, industrial energy consumptions plus associated losses as:

$$\text{Total Energy Sales} = Y_R + Y_C + Y_{SL} + Y_I + \text{losses}$$

where Y_R = Residential energy sales in MKWHR

Y_C = Commercial energy sales in MKWHR

Y_{SL} = Energy Sales for street lighting and highway lighting

Y_I = Energy Sales to industrial loads

Losses = $0.08\ (Y_R + Y_C + Y_{SL} + Y_I)$ as supplied by the company

Residential energy sales = $Y_R = (Y_{RC}) \times$ number of residential customers

where $Y_{RC} = 8674.8 + 430.15(\text{Year}-1960)$ MWHR/customer

The growth of number of residential customers depends generally upon the population increase in PSP&LC's service area. The US Department of Commerce projects for next ten years population increase for State of Washington of 15% while USN & WR projects 5.8% increase in the same period.

Using past data on population, number of customers, these two projections and Y_{RC} we calculated upper and lower limits (designated as U.L. and L.L. in Exhibit 204)of residential energy sales.

Commercial energy sales = $Y_{CC} = (Y_{CC}) \times$ number of commercial customers

where $Y_{CC} = 18.1 + 2.7\, x$ in MWHR/customer

These upper and lower limits of Y_C as given in Exhibit 204 result solely from the necessary use of the two different population projections.

Miscellaneous or street lighting and highway lighting - Y_{SL} - energy sales were estimated by:

Upper limit:

$$Y_{SL} = 152.4 - 13.2\, x + 2.1\, x^2$$

Lower limit:

$$\log Y_{SL} = 1.97818 + 0.038128\ x$$

Energy Sales to industrial loads were estimated as:

Upper limit:

$$Y_I = 400.37427 + 73.4021\ x + 2.83167\ x^2$$

Lower limit:

$$Y_I = 258.79102 + 118.70879\ x$$

Exhibit 204 gives the energy sales obtained by solving the above equations. The upper and lower limit of average power in MW is calculated by dividing total energy by 8760 hours. Peak load demand is then obtained by using the load factor supplied by PSP&LC. In load-resource analysis, we have used the higher value (i.e. upper limit) of load forecasts as can be seen from Exhibit 212. This gives higher estimates of average and peak load demands.

WASHINGTON WATER POWER COMPANY FORECAST

On March 10, 1975, I met Mr. G. F. Nogle, Superintendent, Power Operation at the Washington Water Power Company's offices in Spokane, Washington to gain better understanding of the Washington Water Power Company's load forecast methodologies and to obtain pertinent data for our independent evaluation of WWP's forecasts. We believe that the Washington Water Power Company is one of the few companies in the USA who uses two independent load forecasts - one prepared by 'Marketing Services' and the other by 'Power Supply' - to arrive at final forecasts. Both of these approaches are sound. Briefly, the marketing services group prepares energy sales forecasts for residential, commercial, industrial and public street and highway lighting classes by utilizing direct input from divisional field offices regarding their evaluation of number of customers, economic conditions and load estimates. The Power Supply group prepares two independent average load forecasts - one based on trending past load growth by estimating base loads (all net system loads minus large industrials) and large industrials separately and the other estimate is based on customer and energy usage patterns. The peak load demand in MW is obtained by dividing average load in MW by load factor obtained by extrapolating past historical data.

Our independent evaluation of The Washington Water Power Company's forecasts is as follows:

In developing WWP's load forecasts we have considered total system load as the sum of general business load consisting of residential, commercial, industrial and street and highway lighting, small loads and system losses. We have not included "Contract Sales" in these load estimates because some of the agreements for "Contract Sales" can be terminated by serving termination notice at appropriate times. However, this would involve detailed evaluation of contractual agreements which was beyond the scope of our assignment. Hence, in this testimony, we have reduced the Company's resources by the amount of "Contract Sales".

The total energy sale is divided by class of usage as follows:

$$\text{Total Energy Sales} = Y_R + Y_C + Y_I + Y_{SHL} + Y_{SL} + \text{losses}$$

where Y_R, Y_C, Y_I, Y_{SHL} and Y_{SL} are energy sales to residential, commercial, industrial, street and highway lighting and small loads respectively. Losses equivalent to 10.5% of $(Y_R + Y_C + Y_I + Y_{SHL} + Y_{SL})$ were supplied by the company.

Energy sales to residential customers were obtained by multiplying residential energy consumption per customers by number of residential customers. These projections were found to be linear using past historical data. We have estimated that residential energy consumption per customer increases from 13,561 kWh in 1975 to 17,870 kWh in 1985, and the number of customers increases from 169,772 in 1975 to 212,646 in 1985.

We have also independently verified the increase in number of customers by tabulating the population projections of the counties served by the company in States of Washington and Idaho.

Commercial energy sales was obtained from

$$Y_C = 0.690053 \times 10^6 + 58424x$$

where x = (Year-1965)

Energy sales to industrial class were found to follow exponential growth pattern as given by

$$Y_I = (0.1201727 \times 10^7)(1.02927)^x$$

Street and highway light energy sales were obtained from

$$Y_{SHL} = 0.34436 \times 10^5 - (0.129995 \times 10^4)x + (130.277)x^2$$

Energy sales to small loads are expressed as

$$Y_{SL} = 26.458 + 2.7784x - 0.2317x^2 + .0177945x^3$$

Exhibit 205 gives the energy sales in MKWH by class of usage by solving the above equations for the years 1975-1985. The operating year average loads in MW were obtained by averaging the loads. The peak load demand in MW is then obtained by dividing average loads by load factors supplied by Washington Water Power Company.

PACIFIC POWER & LIGHT COMPANY FORECAST

On March 12, 1975, I visited Mr. R. B. Lisbakken, Vice President, Power Resources, of Pacific Power & Light Company to gain better understanding of PP&L's load forecast methodologies and to obtain relevant data for making our independent analysis of PP&L load growth from 1975 to 1985. All members of my project team received excellent cooperation both during and after the visit. Pacific Power & Light Company projects total system energy sales in MKWH by estimating energy sales of each of the major regions in PP&L's service territory - California-Oregon-Washington region, Montana region, Idaho region and Wyoming region. The energy sales in each region is further divided into base load and industrial load classes. Base load estimates are made by using an exponential equation which is obtained by regression analysis on past historical load data. To this, industrial load estimates are added to obtain total energy sales forecast. Peak load demand is obtained by dividing average power (i.e. energy sales converted to power) in MW by a load factor.

This approach is similar to the one being used by some of the electric utilities in the USA. However, while reviewing our load forecasts we noticed that PP&L consider 'Sale for Resale' as part of the company load and have suggested use of 3.5% of total system load for 'Sale for Resale' load class. I strongly believe that planning future system resources for this class of usage can not be classified as "Project Need". Hence, results of our load forecast analysis are presented with two alternatives - one in which 'Sale for Resale' class of usage is not included in final load forecast and the other alternative in which it is included. However, we have not included 'Sale for Resale' in our load-resource analysis.

Our evaluation of PP&L's load forecast follows:

Pacific Power & Light Company's service area covers parts of Idaho, Oregon, Washington, Wyoming, California and Montana. Because of this large diversity of service area, we have estimated energy sales by each of the States to come up with total energy sales in MWHR. Total average power is then obtained by converting total energy sales after accounting for system losses. System losses were considered to be 9% of the total energy sales. Average load forecast was developed for two scenarios:

1. Total Average Power $= \left(\frac{\text{Total energy in MKWH}}{8{,}760}\right) \times 1.09$

2. Total Average Power $= \left[\left(\frac{\text{Total energy in MKWH}}{8{,}760}\right) \times 1.09\right] \times 1.035$

The factor 1.035 takes into account the estimated growth of energy for "Sale for Resale" classification.

Exhibit 206A gives the average load forecasts for these two scenarios. Total energy was estimated by adding upper bounds of energy estimates of each of the States as given in Exhibit 206. These energy growth estimates were obtained by using the following correlating equations which are based on data from 1962-73.

State of Idaho:

Residential energy sales were estimated using two correlating equations:

Upperbound: $Y_{RU} = 30.14322 - 0.11585\,x + 0.20070\,x^2$

where $x = (\text{Year}-1960)$

Lowerbound: $Y_{RL} = AB^X$ where $\log A = 1.4009$, $\log B = .02964$

Upper and lower bounds of commercial and industrial loads are estimated using:

Upperbound: $Y_{CIU} = 23.52971 + 2.14846\,x + 0.01789\,x^2$

Lowerbound: $Y_{CIL} = 22.63509 + (2.43474)\,x$

Public Street Lighting and Highway Lighting Class:

Upperbound: $Y_{SLU} = AB^{X}$ where $\log A = -0.48269$,
$\log B = 0.02513$

Lowerbound: $Y_{SLL} = 0.33201 + (0.01757)\,x + (0.00081)\,x^{2}$

State of Oregon:

Residential Class:

Upperbound: $Y_{RU} = 1954.77 + (56.04047)\,x + (6.04858)\,x^{2}$

Lowerbound: $Y = AB^{X}$ where $\log A = 3.26527$
$\log B = 0.02308$

Commercial and Industrial Class:

Upperbound: $Y_{CIU} = 2284.12549 + (234.12148)\,x$

Lowerbound: $Y_{CIL} = 2101.66309 + (292.50928)\,x - (3.64926)\,x^{2}$

Public Street and Highway Lighting Class:

$Y_{SL} = 31.77 - (2.4482)\,x + (0.26596)\,x^{2}$

Sales to Public Authorities:

$Y = 53.6458 + 17.77234 \log x$

State of Washington

Residential Class:

Upperbound: $Y_{RU} = AB^X$ where $\log A = 2.69654$

$\log B = 0.02254$

Lowerbound: $Y_{RL} = 491.88892 + (26.63324)\ x + (0.80295)\ x^2$

Commercial and Industrial Class:

Upperbound: $Y_{CIU} = 470.47217 + (38.43073)\ x$

Lowerbound: $Y_{CIL} = 433.24219 + (50.34430)\ x - (0.7446)\ x^2$

Public Street & Highway Lighting Class:

Upperbound: $Y_{SLU} = 6.38393 + (0.20882)\ x$

Lowerbound: $Y_{SLL} = 6.11249 + (0.2853)\ x - (0.0045)\ x^2$

State of Wyoming

Residential Class:

Upperbound: $Y_{SRU} = 136.4814 + (0.70105)\ x + (0.87249)\ x^2$

Lowerbound: $Y_{RL} = AB^X$ where $\log A = 2.06651$

$\log B = 0.03013$

Commercial and Industrial Class:

Upperbound: $Y_{CIU} = AB^X$ where $\log A = 2.06651$

$\log B = 0.03013$

Lowerbound: $Y_{CIL} = 564.09644 + (66.06615)\ x + (1.88805)\ x^2$

Public Street and Highway Lighting:

$$Y_{SL} = 4.72656 + 3.92021 \log x$$

Sales to Public Authorities:

Upperbound: $Y_{PAU} = 7.54114 + (0.03228)\ x^2 + (0.01887)\ x^2$

Lowerbound: $Y_{PAL} = AB^X$ where $\log A = 0.83778$

$\log B = 0.01553$

State of California:

Residential Class:

Upperbound: $Y_{RU} = 157.36696 + (8.29452)\ x$

Lowerbound: $Y_{RL} = 155.93 + (8.75403)\ x - (0.02872)\ x^2$

Commercial and Industrial Class:

Upperbound: $Y_{CIU} = AX^B$, $\log A = 2.21031$

$\log B = 0.21087$

Lowerbound: $Y_{CIL} = 168.36121 + (13.02176)\ x - (0.33868)\ x^2$

Public Street and Highway Lighting Class:

Upperbound: $Y_{SLU} = 1.42582 + (0.13918)\ x$

Lowerbound: $Y_{SLL} = 1.40657 + (0.14534)\ x - (0.0039)\ x^2$

State of Montana

Residential Class:

Upperbound: $Y_{RU} = AB^X$, where $\log A = 1.88096$

$\log B = 0.02451$

Commercial and Industrial Class:

Upperbound: $Y_{CIU} = AB^X$, where $\log A = 1.6676$

$\log B = 0.04776$

Lowerbound: $Y_{CIL} = 44.0246 + (4.96041)\,x + (0.48703)\,x^2$

Public Street and Highway Lighting:

Upperbound: $Y_{SLU} = AB^X$, where $\log A = 0.20683$

$\log B = 0.01144$

Lowerbound: $Y_{SLL} = 1.002 + (0.01241)\,x + (0.00254)\,x^2$

It can be seen from Exhibit 206 that we have used the upper bounds of forecasts in computing the average load demand. This is consistent with general approach of our load forecast analysis where we have used the highest possible load forecasts.

Peak load demand estimates as given in Exhibit 212 was obtained by dividing average load demand by corresponding load factors. Load factors of each region (i.e. California-Oregon-

Washington, Wyoming, Idaho and Montana) were estimated separately and then combined to obtain total system load factor in the year 1984-85. Load factors for year 1973-74 are known. Hence, load factors for in between years were obtained by linear relationship.

MONTANA STATE DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION FORECAST

Our evaluation of Montana State Department of Natural Resources and Conservation (DNR) forecast is based on the review of the load forecasts of applicant companies documented in Volumes I-IV of the DNR Environmental Impact Statement on the Colstrip Project. DNR made two different projections of average and peak loads of all five applicant companies using 1963-73 and 1968-73 load data. By extrapolating past consumption patterns using regression analysis, DNR showed that five year data from 1968-73 yields lower annual growth rate then ten year data from 1963-73. It was argued that recent five year data is a better indicator of trend than past ten year data. DNR also discussed additional factors - population growth, price elasticity, economic growth rate and prices of alternate energy sources - without calculating definite values of the effect of these factors.

We believe that DNR has discussed the general effects of energy conservation, price elasticity and economic growth rate very well, but has used an approach which neglected to analyze underlying causes affecting the load growth. Their forecasts are numerical extensions of the past system load data. We further note that DNR has not properly considered the key factors - population growth, industrial loads and system losses.

RESOURCE ANALYSIS OF APPLICANT COMPANIES

In this section, I will discuss our analysis of the applicant companies resources. The data on existing and planned resources in terms of generation name plate rating, expected date of operation, percent of ownership and type of the generating unit and contractual agreements on either purchase or sale of average/or peak power were supplied by the applicant companies for a ten year period.

There is no uniformity in computation of generation resources of the applicant companies. Some of the applicant companies compute firm average (i.e. energy) resources by first using name plate rating of the generating units and then subtracting a percentage of the unit size to account for the loss of available generation due to maintenance while some other applicant companies compute firm average (i.e. energy) resources by using a different percentage of the name plate rating of the generating unit to account for forced and scheduled (i.e. maintenance) outages. These different approaches for computing system resources become less convincing when the future planned generating unit is significantly of different size and type for which no valid statistical base exists. We are convinced that each of the applicant companies does have valid statistical base, as far as "hydro" resources are concerned. However, these companies are beginning to introduce nuclear and thermal units in their systems. In regards to nuclear units of the sizes that some applicant companies have planned, the power industry lacks such a valid statistical base. The power industry, however, does have a good statistical base for thermal units. Hence, in this resource analysis, we have used the generation resources for hydro and nuclear as given by the applicant companies but used fossil plant operating availabilities based on their sizes using a "Report on Equipment Availability For the Ten-Year Period, 1964-1973" (Edison Electric Institute Publication No. 74-57, Issued December 1974) prepared by the Equipment Availability Task Force of the Prime Movers Committee of Edison Electric Institute.

Specifically, following values were used:

Unit Size (MW)	% Operating Availability
less than 60	91.7*
60 - 89	91.7
90 - 129	88.3
130 - 199	89.0
200 - 389	85.9
390 - 599	79.6
600 and above	72.9

*We have assumed this value for this study for unit sizes less than 60 MW, although we believe that the operating availability will be higher.

The operating availability affects average or energy resources. Hence, in the following, we will give our analysis of each of the applicant companies' average resources.

MONTANA POWER COMPANY AVERAGE RESOURCES

Exhibit 207 gives the results of our analysis of average resources of Montana Power Company based on the latest information submitted to us by the company. In computing these resources, we have considered that oil will be available to allow operation of 'Bird' generating unit. We are quite aware of the Federal Energy Administration Policy to discourage the operation of the oil fired units which were originally converted from coal to oil.

Also, in computing 'hydro resources', critical rating of the hydro units are considered. No allowance has been made for 'median water adder'. This practice gives less generation resources than can actually be available on the average.

We may further note that in computing MPCo's average resources, we have excluded Colstrip Units #3 and #4 to enable us to evaluate the surplus or deficit in generation for meeting load demands in 1975-1985 period.

Montana Power Company's estimation of its resources are given in Exhibit 212 assuming that oil will be available for 'Bird' unit.

PORTLAND GENERAL ELECTRIC COMPANY AVERAGE RESOURCES

We have computed the average resources of Portland General Electric Company on the same basis as MPCo. Exhibit 208 gives the tabulation of our determination of their resources based on the data supplied to us on March 13, 1975 and April 3, 1975. Average resources given by PGE are tabulated in Exhibit 212.

PUGET SOUND POWER & LIGHT COMPANY AVERAGE RESOURCES

Exhibit 209 gives results of our resource analysis of Puget Sound Power & Light Company based on the revised data supplied to us by Mr. Knight. (Exhibit 18B, D. H. Knight

Testimony - Colstrip #3 and #4, prepared on March 31, 1975). In computing these resources, our approach was the same one that we used for MPCo. We have not included Skagit #2 unit in these resources because of the change in operational date to February, 1986.

Average resources as computed by PSP&LC are given in Exhibit 212.

WASHINGTON WATER POWER COMPANY AVERAGE RESOURCES

In evaluating Washington Water Power Company's resources, we have reduced total resources to account for "Contract Sales" as discussed earlier in "WWPCo Load Forecast Section". The resource data dated March 6, 1975, was supplied to us by the company. Exhibit 210 gives our results of our analysis of WWPCo's average resources.

Average resources as computed by Washington Water Power Company are given in Exhibit 212.

PACIFIC POWER & LIGHT COMPANY AVERAGE RESOURCES

In computing Pacific Power and Light Company's resources we have not considered "internal combustion" which may at most provide 6 MW of average energy. Also, Skagit #2 was excluded in this computation because of the delay in operation date to February 1986.

Exhibit 211 gives our evaluation of PP&L's resources.

The resources as given by PP&L are given in Exhibit 212. The method of computing company's resources is the same as that used for MPCo.

LOAD-RESOURCE ANALYSIS

In this section, I will discuss the load-resource analysis of both five applicant companies acting as one and Montana Power Company. As discussed earlier, load-resource analysis requires that we consider estimated system loads, system generation resources and reserve requirements of a power pool-North West Power Pool (NWPP). NWPP recommends that each of the companies of NWPP maintain a reserve as given in Column B of Exhibit 214. NWPP wants each of the power companies to increase percent reserve from 12% in 1975-76 to 20% in 1983-84 using a linear relationship. We were unable to find a study outlining the rationale on which this recommendation is based. However, without going into a discussion of the basis on which these reserve requirements were derived, we assume these reserve requirements (Column B of Exhibit 214).

Before discussing load-resource analyses of applicant companies and Montana Power Company, I would like to stress the fact that in case of doubt, we have consistently used higher values of load forecasts and lower values of companies' resources. This implies that in case of doubt, we have projected higher generation capacity requirements.

Load-Resource Analysis of Applicant Companies

In Exhibits 212, we have tabulated average and peak surpluses (deficits) in MW of the applicant companies combined by subtracting average and peak load estimates from average and peak resources from 1975-76 to 1984-85. Using these surpluses (deficits) we have calculated estimated percent available reserves as given in Column (C) of Exhibit 214. Upon comparing Columns (B) and (C) of Exhibit 214, we note that 'applicant companies' have adequate generation resources to meet peak load requirements up to operating year 1979-80. After 1980-81, they need additional peaking capacity to meet NWPP reserve criteria. The additional peaking capacity required is given in Column (D) of Exhibit 214.

It is obvious upon examination of average power or energy surplus of Exhibit 212 that 'applicant companies' need 125 MW of additional energy capacity to meet their estimated average demands in 1981-82.

Load-Resource Analysis of Montana Power Company

Average and peak surplus (deficit) in MW of Montana Power Company are given in Exhibit 213 for 1975-76 to 1984-85. Reserve requirement to meet NWPP criteria is given in

Exhibit 215 Column (B). Upon subtracting these reserve requirements in MW from peak surplus (deficit) in MW we obtain peak surplus (deficit) in MW as given by Column (E) of Exhibit 213. It is obvious that MPCo lacks peak resources to meet their peak load demands from 1977-78 to 1984-85. Hence, MPCo needs additional peaking capacity as given in Column (C) of Exhibit 215.

It is also obvious from Exhibit 213 that MPCo has enough average (energy) resources to meet their average load demands up to 1978-79. However, our analysis shows that they need additional average (energy) resources in 1979-80, and from 1981-82 to 1984-85 as given in Column (D) of Exhibit 215.

DISCUSSION OF AVAILABLE ALTERNATIVES

Load-resource analyses of applicant companies and Montana Power Company clearly show the need for additional peaking/or energy capacity to meet peaking and/or energy (average) load forecasts. Towards this end, I recommend a combination of one or more of the following alternatives:

1. Install peaking and base load units to meet peaking and energy shortages from the operating year 1980-81 to 1984-85 for applicant companies combined and from operating year 1977-78 to 1984-85 for Montana Power Company. We feel that generation-mix studies be conducted to determine optimum combination of peaking and energy resources for both the applicant companies combined and Montana Power Company before exact capacity of peaking and base load units are established. This "generation-mix" study must consider existing resources, maintenance schedules, outages, production costs of each of the existing units and capital costs, production costs and maintenance schedules of future planned units.
2. Improvement in system load factor by implementing load management controls.

Since peak load is the ratio of average load over a designated period of time to the system load factor, the increase in system load factor would reduce peaking load which in turn would reduce peaking capacity. The system load factor can be improved by cutting down sharp peaks and deep valleys in daily load profiles by implementing load management controls. The implementation of 'load management' requires (i) shifting of controllable loads from peak load period to off-peak period and (ii) application of storage devices. The loads such as heating loads (consisting of space and water heating), air conditioning loads, water pumping for various purposes, and window displays and public illuminations can be controlled efficiently.

The implementation of load management controls will increase system load factor and hence decrease peak load demands. One European utility has increased its load factor from 0.7 to 0.9 in four years. However, cost of implementing these controls must be considered.

I would, however, like to make it clear that I am not recommending a system load factor equal to one.

Unity load factor means there is no peak or valley in a load profile. I believe that an optimum load factor will be between the existing load factor and unity load factor and can be determined for each of the applicant companies by analyzing characteristics of all loads in utility's service area.

3. Reconsideration of 'Northwest Power Pool' Reserve Requirements.

Reserve requirements are generally expressed as a certain percentage of peak load.

Peak capacity requirement, therefore, increases with the increase in reserve requirements. The present reserve requirement of Northwest Power Pool (NWPP) is based on reliability criteria which use LOLP (loss of load probability) of .05 days/year or 1 day in 20 years. LOLP is defined as the probability of failure to serve expected (forecasted) load over a specified period of time. I am not aware of any detailed study justifying the validity of using LOLP = 0.05 days/year. Most of the reliability councils have recommended LOLP = 0.1 day/year. However, this value may not be considered a standard. Instead, a more realistic value of LOLP must be developed by considering existing generation resources, external tie ratings, maintenance requirements, a load uncertainty distribution, changing annual load shape, etc. Since reserve criterion is based on LOLP, its justification is open to question.

4. Improvement in electrical generating plant availability. It is obvious from our 'resource analysis' that we are not utilizing full capacity of electrical generating plants. In some instances, we utilize as little as 73% of the plant capacity. I believe that plant availability can be improved by following some of the actions recommended by Federal Power Commission in a Bureau of Power Staff Report titled 'Electrical Generating Plant Availability', May 1975. Improvement in plant availability results in efficient utilization of system resources and increases energy or average resources.

5. Purchase peaking power from Northwest Power Pool if possible.

HEARINGS EXAMINER: Do you have any exhibits with this witness, sir?

MR. SHENKER: Yes, Mr. Davis. In connection with the offer of the testimony of Dr. Kanu R. Shah, there are three typographical errors that should be corrected. First, on page 13, line 6, after the word "factors," the phrase "lower than that" should have been inserted. Next, on page 18, line 3, after the word "estimated," the phrase "leveling off to" should have been inserted, and finally, on page 52 in the numbering of the statement, which is also Exhibit 206-A, the second column where it now refers to Table 6 should be referring to Exhibit 206. In connection with, and through the testimony of Dr. Shah, the Department of Natural Resources and Conservation will offer the Department's Exhibits 200 through 206, Exhibit 206-A, Exhibits 207 through 211, Exhibits 212-A through J, and Exhibits 213 through 215.

HEARINGS EXAMINER: Very well, Mr. Bellingham, you may cross-examine.

EXAMINATION OF DR. KANU R. SHAH

Cross, by Applicants:

By Mr. Bellingham:

Q I think you note in your testimony that you have been involved in load forecasting only since 1969. Am I correct in that?

A That is true.

Q What did you do prior to that?

A Prior to that, I was doing research in other areas of power systems and also was presenting EC generating machines.

Q What has been the nature of your experience since 1969 in load forecasting?

A The nature of my experience was in the capacity of consultant, in the capacity of program development for load forecasting, and in the capacity of guidance to the people who are making the load forecasts.

Q On page 4, line 12, you note that utilities serve seven different states. What states are those, do you know?

A Montana, Idaho, California, Oregon, Washington --

Q And Wyoming?

A And Wyoming.

Q Well, that's six. I think, also, you probably intended to include Utah?

A Probably, yes.

Q I might mention, I don't think it's important at all, but to get the record straight, I think transmission lines only go into Utah from the Pacific, as I understand it. They don't actually serve that state as such.

MR. SHENKER: The Montana Power Company has interconnections with Utah, Mr. Bellingham.

MR. BELLINGHAM: An interconnection, maybe, but we don't serve any load.

MR. SHENKER: You do now.

MR. BELLINGHAM: Mr. Shenker is testifying here, and I'm not sure it should really be part of the record.

MR. SHENKER: Well, when you testify, Bill, it seems only appropriate that I testify, too.

MR. BELLINGHAM: Have I testified this morning?

MR. SHENKER: Yes, sir.

MR. BELLINGHAM: I've asked cross-examination questions.

Q Well, anyway, we might have to change that seven to six, Dr. Shah, am I right in that?

A Again, the information that I have is that if you are supplying the load to Utah, that it should be included.

Q Fine, and if they don't supply any load, but merely transmission lines in Utah, it would be reduced to six, is that correct?

A That is true, yes.

Q I don't think it's important, Dr. Shah. I just wanted to get the record straight.

Q I think you indicate that your information that you have used in the tabulation of your exhibits and the preparation of this testimony was obtained from the five applicant companies, was it not?

A The basic data was obtained from the applicants, yes.

Q And in order to obtain that, you had to go to each of the five companies and sit down with some of their personnel and obtain the data from them?

A Yes, sir, and subsequently, also, they furnished some information.

Q Upon your request, information was furnished to you, by mail, I presume; is that right?

A By mail and by phone.

Q And you found all of these applicant companies very cooperative in obtaining that data, I understand?

A Yes, sir, they were very cooperative.

Q You have no complaint at all relative to their attitude or approach or cooperation with you?

A I had excellent cooperation.

Q At the bottom of page 7, you say that "We feel that 'energy conservation,' 'price-elasticity' and 'cross-elasticity' will impact energy consumption patterns of each class of customers". I'm reading now at the top of page 8. "However, because of the lack of any definitive study in the service territories served by the applicant companies, we have not included the effects of these factors in load forecast estimates." Now, then, as far as price-elasticity, that would tend to drive the usage of electricity down, isn't that right?

A That is true.

Q As far as cross-elasticity, that serves the opposite purpose; that would drive the cost of electricity -- rather, the use of electricity -- up?

A Yes, sir.

Q Now, you say a lack of any definitive study -- cranking in conservation and elasticities of various kinds is something rather new in the load forecasting business, isn't it?

A Yes, it is new, but this was there for the last three or four years.

Q Yes, but I mean it's a relatively new concept?

A The concept was there, but the introduction of the effect of that concept or taking into account the effect of that concept into the local custom, to most of the power companies, was new.

Q And energy conservation, obviously, because we haven't had any real definite energy conservation up until the year 1973 or so, isn't that right?

A That is true.

Q There is a problem in how to attack each one of these concepts, insofar as load forecasting is concerned?

A The problem is the basic data that is required in order to determine the accurate effect of these factors on the load forecast, and if this basic data has been developed through experience, then it can be, equally, in the load forecast.

Q Well, as a practical matter, many companies still are working on the problem and do not include the effects of these in their load forecasts, isn't that right?

A Those companies who have developed that basic data and who have the resources of undertaking such tasks have included it; for example, Southern California Edison is in the process of including it.

Q It's in the process of including it, but it hasn't, previously?

A I think they have already included it in the summer of last year.

Q But you're not sure of that?

A I'm 99.99% sure.

Q Well, we'll accept your figure and assume that you're reasonably sure, then, is that all right, Doctor?

A Yes, sir.

Q But most companies have not done this as yet?

A Yes, this is true.

Q They have not cranked these figures into their load forecasts as yet?

A This is true, but again, as I mentioned, the reason that they are not included is No. 1, the basic data deficiency, and (2) the resources, as far as technical manpower is concerned.

Q Well, most companies are looking at these items and these effects, aren't they, and they're trying to wrestle with them and come up with a logical solution as to just how to approach it and how to put them into their forecasting techniques, isn't that a fair statement?

A I would say they are trying to include such effects.

Q At least, they're looking at them, aren't they?

A Yes.

Q They recognize it as a new technique and a new effect, and they're wrestling with the problem, but they're having problems with it, isn't that it?

A In developing the basic data, yes, sir.

Q Well, now, on page 11, line 9, you indicate that "The load forecast methodology used by Montana Power Company appeared to be reasonable in the past," and there's nothing new about the technique or the methodology, that Montana Power has used in its forecasting in the past, is there?

A No. It is the technique that worked in the past, that the load growth was in a systematic pattern, but the effect of various factors having cross-effects -- for example, cross-elasticity having an effect upward; price-elasticity having an effect downward; pollution factors having an effect upwards, and energy conservation having an effect downwards, and these factors were not of major importance -- then the technique worked, and it worked well, as I stated.

Q This was a typical technique used by power companies generally, wasn't it?

A Well, some power companies used that technique, some power companies used --

Q I think the term that has been bandied around here is trend extrapolation?

A That is true.

Q And this is certainly nothing new insofar as forecasting techniques in the utility companies, is it?

A No, it is not new.

Q And it's been used successfully by Montana Power and other companies in the past, hasn't it?

A That is true.

Q It has served their purposes as far as load forecasting is concerned?

A In the past, yes, sir.

Q You feel now that there's no assurance that this method will estimate future base loads accurately because of the injection of these new factors in?

A That is true.

Q And you would like to see Montana Power commence injecting these new factors into their methodology?

A Yes, sir.

Q And do you know whether Montana Power is presently studying these factors with the view of injecting them into their load forecasting?

A My recollection in my meeting with Mr. Hofacker was that they are looking at it; however, I do not know at this stage how much progress they have made in this area.

Q You didn't interrogate them, I gather, to any great extent, as to how much emphasis they're putting on this?

A I asked them if they have included it in their forecast. My purpose was to come up with an objective analysis of the forecast that they made in 1975, and at that point, whether they have included it or not; that was my concern.

Q Your answer was that they had not included it, but he also volunteered the information, I gather, that they were looking at it with the idea of including it in the future?

A Yes, sir.

Q So they, in effect, are doing pretty much what other utility companies are doing in the Pacific Northwest, isn't that right? They're analyzing it with the view of using it in the future?

A They are looking at it; however, the extent to which they are looking at it, I do not know.

Q I'd like to have you turn to page 16, if you will, and I think you said, on line 7: "PGE's load forecast is consistent with generally accepted approaches used by utilities around the country."?

A Yes, sir.

Q And that is true of all five applicant companies, is it not?

A Well, when you look at the Pacific Power and Light Company, and some of the approaches that they have used, where they considered the energy load, this has not been considered by other places in the country.

Q It's something that is unique to them, is that right?

A Can you amplify? What do you mean by them?

Q You're talking about Pacific? You menticned Pacific.

A Pacific Power and Light.

Q And you say that they're doing something that is not normally done, is that right?

A This is true.

Q And so this is unique to them?

A Yes. I cannot generalize your general statement that the approach is better.

Q Let's try it again. We'll modify it somewhat. With the exception of Pacific, then, wouldn't you say that the techniques and methodology used by the other four applicant companies are consistent with generally accepted approaches used by utilities around the country?

A As you can go through with my statement for each of the power companies, I have tried to be as complimentary to the approaches used by various companies, as possible, and in this particular case, I found that Pacific Gas and Electric has done a very good job in their load forecast and looking into various factors which affects the forecast, like breaking the total load into subcomponents and projecting each of the subcomponents separately, and that made me make that statement that it is consistent with the other approaches, by the utilities around the country.

Q You just mentioned Pacific. You say that Pacific is doing a good job?

A Yes, sir, as far as I looked at their load forecast, they have done a good job in it. I would say that their approach is consistent.

Q Well, then, there's nothing unusual about the approaches of any of these companies, is there?

A Well, Washington Power and Light Company has a very good approach. They forecast from two different viewpoints.

Q So they can check up on each other?

A This is a very logical way to do.

Q Then I gather that you are not overly critical at all of any of these companies as far as their methodology is concerned?

A No, sir.

Q In fact, you're not critical at all, are you? You think that there are, perhaps, certain techniques that they can use, but basically, you're pretty well satisfied?

A What I have stated is that the techniques that they have used in the past have worked; however, the injection of new factors needs to be considered in order to make the technique work for the future.

Q And these new factors are undergoing study by the companies?

A Yes, sir.

Q With the idea of including them in their methodology?

A Again, I cannot say with assurance.

Q But they are studying?

A This is what Montana Power Company indicated to me.

Q As far as the DNR approach is concerned, at page 33 -- at the end of that particular study, I think you indicate some defects and problems with the Department of Natural Resources' approach in their impact statement, do you not?

A Yes, sir.

Q What are those problems?

A As I discussed here, on page 33, line 23, "We believe that DNR has discussed the general effects of energy conservation, price elasticity and economic growth rate very well, but has used an approach which neglected to analyze underlying causes affecting the load growth. Their forecasts are numerical extensions of the past system load data."

Q Well, the DNR did not properly consider key factors that you mentioned, population growth, industrial load, and system loss, is that right?

A This is true.

Q Do you know why they omitted them?

A No, I do not know, sir.

Q Well, these factors were considered by the other applicant companies, in their own forecasts?

A Yes, sir, and it should be considered in order to come up with an accurate forecast.

Q Well, these are normal things that are always included in the methodology, or generally included, and all five applicants were aware of these factors and had, in fact, included them in there?

A They have included them, yes.

Q I'm interested in your values used at pages 35 and 36 relative to the operating availability.

A Yes, sir.

Q Do you know what the five applicants used, insofar as availability is concerned?

A As I recall, the applicants have used, as far as I recall, for units higher than 600 megawatts, 75% --

Q Excuse me, I didn't understand. What do they use?

A They have used 75%, some applicant companies. Now, Montana Power Company used the full rating, and then, in the result, they deducted a certain amount for maintenance and other operational reasons.

Q Do you know that Montana Power has now modified their approach and they use 75%? Are you aware of that?

A This information was not given to me.

Q Well, I think it's probably something rather new, but I think Montana Power, for your information, is attempting to approach the same 75% operating availability as far as the second year is concerned, and as far as the first year is concerned, do you know what figure they use?

A No, I do not know.

Q Would you be surprised if I told you that they use 65%?

A That strikes somewhere around that figure.

Q And there wouldn't be anything unusual about that, because the problems that are generally inherent in starting up a unit, they use a different operating availability for the first year, isn't that it?

A Right now, let us clearly understand that we are talking about unit sizes in excess of 600 megawatts, because for unit sizes less than that, that column is different. It's given here.

Q I understand that, but I'm talking about the applicants. I'm not talking about your approach or the EEI approach, I'm talking about the approach of the applicants, and they do not change it, based upon the unit size, do they?

A No, they do not, and this is where we differ.

Q Yes, I think we agree on that. It takes me a little time somewhat -- I go around the barn to get all the facts assembled and everything, but you disagree on the unit size as to how to apply these various operating availabilities, isn't that right?

A Right.

Q And you have accepted the Edison Electric Institute publication, its report, as to the percent of operating availability, based upon unit size, as set forth on page 36, isn't that right?

A Yes. What I have said here is that this is the most statistical data that is available, and any power company that designs the facilities, should take this into account in computing their resources.

Q You say they should?

A Yes.

Q I think we're dealing with a subject here that honest people could well disagree on, isn't that right, whether or not that they should accept this particular approach or perhaps use an approach that they used in the past?

A For a well-managed engineering job, they should shoot for the numbers in excess of those given here in order to show that we have done a remarkable job in designing the facilities and planning the facilities and after it was finished, keeping it in good shape, because when you are putting millions of dollars in and you are not comparable with the average of the industry, then you are not doing a good job. I don't mean you, but any power company.

Q Well, I think it's to a power company's or utility company's best interest to operate their generating units at the highest operating availability that they can, isn't that right?

A Yes. If they design it properly, if they have steps to maintain it properly, then this can be executed.

Q Well, you will admit, won't you, that utility companies, in their approach to this, will use their experience gained from past operations of a unit, will they not, as far as inflicting or imposing a certain availability upon their units?

A Past experience is just a guide, but the available technology in the other areas of the industry, the developments that have taken place in the technological work, should be incorporated in order to build up the maximum benefits from a given capacity.

Q Well, let me ask you this: it isn't true that every utility company in this country is using these statistics that you use at page 36, is it?

A One of the reasons is that --

Q Excuse me, if I may, Doctor, will you answer the question? Yes or no?

A I cannot give you an unqualified yes or no. I'm sorry.

Q Well, it's true that not all companies -- this is my question -- it's true that not all companies are using the same approach that you use at page 36, isn't that right?

A I cannot say that. The only thing I could say is that this is the approach that I would use.

Q But you know, for example, that the Montana Power Company doesn't use that approach, isn't that right?

A What I can say is that I'm not sure of what this is that Montana Power Company has made, but some of the other companies do not use the same approach. Again, this depends on what experience they have and what are the guidelines that are coming from the federal government.

Q Well, isn't it true that you haven't found, in your experience working with the power companies, that any one of those companies uses uses operating capability as set forth at page 36, do they?

A Well, it is their viewpoint, and it is up to them whether they want to use it or not.

Q Well, we understand. You like your figures; you like that approach, isn't that right?

A No, it is not liking or disliking. It is the factual evidence available to the industry, and any company which is in the business for operating it for most economical reasons, must adhere to, and if they don't, then they must improve the availability of the units.

Q Now, I think we know what your opinion is --

A No, this is factual evidence, and what I think we have to do here is, without bringing my opinion, I try to rely upon the opinion collected from the data from the Edison Electric Institute.

Q Now, let's go back to the original question about the five applicant companies. They do not use the same operating availability as you've set forth at page 36, do they?

A It is up to them --

Q Dr. Shah, you know that they do not use these figures, do they?

A Yes, they do not use those figures.

Q All right, that's all I'm trying to get from you. They do not, do they? They use different figures, isn't that right?

A They use different figures, but again, they differ on those figures.

Q But they have reasons for using different figures. You will assume that, won't you? Won't you give them that presumption?

A Well, I would rather not comment on that.

Q Well, you don't agree with them; I have no doubt of that, and they don't agree with you?

A Our purpose was not to see whether they were right or not; our purpose was to say what we think was right.

Q Now, when we analyze your figures and compare them with the applicant companies, we find that, spread out and analyzing the various generating units, your figures will have a pattern of inflating their resources over their own figures, isn't that right?

A I have not checked how they do in terms of their foresight units; however, even if it inflates them, I do not care about it. What I am interested in, is, what is the logical approach to developing their resources?

Q Well, let's go back to the question again. As a practical matter, it's common sense, isn't it, that the use of your figure will inflate resources of the applicant companies over the figures that they use?

A The resources will be increased if these operational factors are used.

Q Fine. Now, that's all I was trying to get you to say, Doctor Shah. Now, these figures that you use at page 36 include all fossil plants, do they not?

A As of 1973.

Q Now that includes gas and oil-fired plants, doesn't it?

A Yes.

Q It also includes coal-fired plants?

A Yes.

Q Now, isn't it true that gas and oil-fired plants have much higher availabilities than coal plants?

A Yes.

Q And there's a good reason for that, isn't there? The coal-handling equipment imposes a considerable additional availability risk, isn't that right?

A Yes.

Q You'll agree with me on that?

A Yes.

Q Are there any other reasons why gas and oil-fired plants have higher availability?

A The other thing that I can think of is that oil and gas-fired plants create a clean energy, where you do not have the scrubbers or other pollution devices.

Q I think that's a good point; so that's another reason why higher availabities can be attributed to gas and oil-fired?

A But the figures that appear at the cross-section of many, many units around the country, so that when one is up, the other is down, the figures average it out, and this is the representation of fossil plants of various companies.

Q Well, now, do your operating availability figures here take into account those periods of time when a unit may be available to run, but not to run at full power because of some other limitation, such as feed pump outages, coal hopper stoppages, and so forth?

A No, it does not take this into account, and one of the reasons is that when we plan resources, let us valuate the basic design of the components; and let not one component, or two components, use the operating ability.

Q All right, let's turn to Montana Power, shall we?

A Yes, sir, which page?

Q Well, you mention them in quite a few pages. I think probably we'll go to the exhibits, perhaps, first of all. Exhibit 213 -- now, that exhibit has been revised, hasn't it?

A Yes, sir, what happened in typing, my typist changed some numbers.

Q Well, the figures were changed in the lefthand column as far as the reserves are concerned, isn't that right?

A Yes, but again, this was a mistake on her part. This came from Exhibit 215.

Q And also, you changed some figures, D and C, around, in the resources section, isn't that right?

A This is the typographic error the typist made.

Q And also the figure 32 on the righthand side, which originally appears as 27? That is an error that you didn't catch in the beginning?

A Yes.

Q I guess it shows that we all make mistakes, Doctor Shah, isn't that right?

A We are humans, but this was a typographical error.

Q Now, then, let's take up your loads in the first column. You have there in Column A, Applicants' Composite Forecasts? I think that's Applicant Companies, I'm sorry.

A Yes, sir.

Q Applicant Companies' Forecast -- and that is, in this case, Montana Power, of course?

A Yes, sir.

Q Now, then, on the lefthand side, you have "Average." We're talking there about average energy, are we not?

A Yes, sir.

Q And you have the years from '75-'75 through '84 and '85?

A Yes, sir.

Q Incidentally, I note that all of the applicants extended theirs out for a full period of ten years, that is, including '85 and '86? You did not do that?

A We considered from '75 to '85, which is ten years.

Q Now, then, where did you get those particular figures of average energy under Load Column A?

A We got this from the Montana Power Company.

Q Wasn't this the same as their old exhibit, No. 6, that was prepared for introduction into this case last year?

A I do not know what that exhibit is. What I have here was the information given to me when I visited them in Butte, Montana.

Q I'd now like to hand you what has been marked as Applicants' Exhibit No. 6, and so that there will be no mistake about it, this is one of the original exhibits that was introduced in this case by Montana Power when we first opened these proceedings back in May of last year?

A I am looking at this exhibit, and this corresponds to the same exhibit that was given to us.

Q So that you have compared the figures in Montana Power's original Exhibit 6 with the figures that appear under "Average Energy" in column A of load, and find them comparable, is that right?

A The figures are the same.

Q Now, then, let's turn to the second column, "Peak," under column A, and I'd like to now hand you Montana Power's old Exhibit 5. Do you have that at hand?

A I do not have the exhibit marked.

HEARINGS EXAMINER: Mr. Bellingham, when you say old Exhibit 5, is that an exhibit that's in evidence?

MR. SHENKER: It was received on May 28, 1975.

HEARINGS EXAMINER: Fine, thank you.

A Yes, I am looking at that exhibit, and again, the figures that were given there, were the same figures aupplied to us.

Q All right. I would call your attention, however, to the year '84-'85. Was there a question here?

A Yes, I think there is an error here.

Q There is an error there, is there not? You have a figure of 1521 under "Peak" for '84-'85, and that figure should be 1563, isn't that right?

A Yes, let me check again why this was changed. It was subsequent information that was given to us. It should be 1563.

It was an error on our part.

Q Actually, the difference is nothing to be startled or alarmed about, is it, Doctor Shah?

A No, it is not that much important.

Q It does change your figure down the line, however, doesn't it?

A Well, it changes the figure for '84-'85, and that's all.

Q All right, now, let's move over to Column B, and you've got that CAI Forecast?

A Yes, sir.

Q Now, then, as far as average energy is concerned, what chart did you obtain those particular figures from?

A This is from Exhibit 201.

Q And the same is true as to peak? That's Exhibit 201?

A That is right.

Q And those are your figures that you utilized, following your examination and following your preparing and completing your load forecast?

A Yes.

Q I'd like to ask you -- and I'm going back now to the applicant companies' forecast -- you used the old exhibits. Were you aware of the fact that since that that exhibit was introduced, Montana Power has a new load forecast out and that that was introduced into testimony in this case subsequent to the time that it was convened during the month of February, and the new forecasts appear in evidence as Exhibits 6-B and 5-B? Have you seen those?

A I saw yesterday night this is the new forecast that they made. I saw it yesterday night.

Q That was the first time that you had seen those forecasts?

A Before that, Mr. Shenker sent me some data, but I do not have time to look at it.

Q But you are aware of it now?

A I am aware of it now.

Q Now, then, let's move over to the resources column in the middle. Now, under that first column, you've got "D." You've got "Applicant Company's Analysis." Now, then, under "Average Energy" in the first column, what exhibit did you obtain that from?

A Are you talking about C or D?

Q Under "D" -- I'm sorry -- as you changed it. Under D, that indicates, on my revised No. 213, it states "Applicant Company's Analysis,"isn't that right?

A Okay. What we did in the new exhibit, we put down "C" for Applicant Company's Analysis and "D" for GAI/CAI Analysis. The figures are the same, it's the numbering of C or D.

Q Didn't we change under "D" Applicant Company's Analysis? Should we put there CAI Analysis?

A Right.

Q All right, fine. Now, that was not changed on the exhibit? On mine, anyway.

A I think the exhibit that we have given to the --

MR. SHENKER: The figures are the same; the columns have just been moved over to the A, B, C, D, instead of A, B, D, C.

Q Yes, but I'm talking about the heading, and under D -- and I'm talking about the Revised Exhibit 213 -- my D under it, states

"Applicant Company's Analysis."

A Is that the old one or the new one?

Q No, sir, that's the new one.

A Let me see that. It should be GAI. Here is mine. You can see here.

Q Well, I have 1/26/76 marked at the bottom of mine and you have the same. Mine has not been changed, and I wonder if the exhibit, as far as the board is concerned, has been changed?

A I brought some new revised copies. The figures are right.

Q I understand. I know what happened, and I'd like to get it straightened out. What I'm wondering, is the board, in the original exhibit here, in the new testimony -- is it the same as mine, or has it been changed, those particular headings?

MR. SHENKER: It shows for Column C "Applicant Company's Analysis" and for Column D, "GAI/CAI Analysis."

MR. BELLINGHAM: Okay. I wonder if I might have a copy of the corrected exhibit.

MR. SHENKER: John has it.

(MR. ROSS GIVES COPY TO MR. BELLINGHAM.)

Q Turning to "Resources" and Column D CAI Analysis, under average energy, that particular column, that commences with the figure 763 for 75-76, was obtained from what exhibit?

A It was obtained from Exhibit --

Q 207?

A Right, page 53.

Q The second column, under D, denoted "Peak" was obtained from what?

A From Montana Power Company sources that they give us, and we have here the same resources.

Q Would you compare that with Exhibit 5, that is, old Exhibit 5, Montana Power, and I think you'll find that the figures there are the same, is that right?

A Yes, sir.

Q Now, then, on "Applicant Company Analysis," under Section C, average energy, where was that figure obtained, and I should say figures. The first figure is 732 for the year 75-76.

A Okay. What we did is, we computed the resources that were given to us, and then we added the Bird unit, which is the oil-fired unit, to come up with this number 732.

Q All right, you used the figures that were given to you by Montana Power and added to that the Bird unit, as set forth in Exhibit 207; am I correct on that?

A Let me check again.

Q You see, our problem is that we were never able to find out just how you did this.

A Okay, let me give you how I calculated. Total resources are 716, which appears in Column 1 of Exhibit 6, right?

Q Yes.

A Then, maintenance is 31 megawatts; reserve is 30 megawatts, and interruptible is 30 megawatts, and Bird unit is 64, and from there, if you subtract maintenance, reserve and interruptible, which comes out to be 48, then you come up with 732.

Q Now, you don't have that explained in any exhibit, do you?

A No, sir.

Q So we couldn't take these charts and determine that without having the knowledge that you have?

MR. SHENKER: I'll object to that, Mr. Davis. All the knowledge that he has was obtained from the resources and the information supplied by the Montana Power Company.

HEARINGS EXAMINER: He can explain how it is. You can answer the question. Overruled.

A Well, the philosophy that we laid down in computing our resources and the resources of the Montana Power Company were not to include maintenance, reserve and interruptibles in the average energy, and when you consider that, then you can subtract 48 megawatts and add Bird unit, which gives 64 megawatts and you will come up with net resources of 732 megawatts.

Q Going back to my question, there's no way that we can determine from the exhibits, how you arrived at that figure, is there, that appears in your statement?

A Well, here I am explaining.

Q But there's no way we could do it outside the explanation?

A Well, you can see that maintenance and reserve and interruptible cannot be considered as average energy.

Q Let's start that chain of figuring again. We start off with a figure of 716, which appears in Exhibit 6, is that right?

A Yes, sir.

Q And to that, you've added 64 for Bird?

A Yes, and then I subtract 48 megawatts, which considers the maintenance, the reserve, minus the interruptibles.

Q And then what did you do?

A Then you come up with 732 megawatts.

Q You followed that same procedure for each of the subsequent years after '75-'76?

A Yes, sir.

Q In that particular column?

A Yes, sir.

Q Now, then, as far as your peak figures, shown in the second column, under group C, you've used the same peak figures there that you use over, insofar as your own CAI analysis, is concerned, in column D, isn't that right?

A Yes, sir, the same peak values that are used by the power company.

Q And that is the same as in Exhibit 5?

A Yes, sir.

Q Now, then, you've headed this particular column "Applicant Company's Analysis." Now, in that applicant company's analysis, they did not include the Bird unit insofar as average energy is concerned, isn't that right?

A Yes, but we felt that they should have included it.

Q I understand that, but go back to my question again. In Exhibit 6, which shows Montana Power Company's loads and resources, they did not include any average energy for Bird, did they?

A No, they did not, sir.

Q And you took it upon yourself to include that?

A The objective here in this --

Q Would you answer the question, please?

A I took upon myself what I thought was right.

Q Right. We understand that. Don't get me wrong, I'm not going after you for the method that you used here, but I'm saying that your procedure did not follow Montana Power's procedure, did it?

MR. SHENKER: Just a moment. The witness was interrupted in his answer. He's entitled to continue his answer and I'd like to hear the rest of his answer when he was interrupted.

Q I'm not sure that I interrupted. If I did, I'm sorry. Shall we start over again?

A Let me continue, on what I was to say before.

Q Fine.

A In the Applicants' Exhibits 5 and 6, as you presented them a moment ago, in these exhibits, they do include Bird for 64 megawatts. They include maintenance and reserve and all of the other factors that we have considered, and it is the different way of computation that they have given. They also include median water adder, which we have not considered in this particular thing, so what we tried to do is that given the resources as predicted by the power company, here is the figures which is compatible with the practice for energy resources and what will become of it and this is what the column C is.

Q When you look at Exhibit C, Bird is mentioned down at the very bottom, isn't it?

A Yes, sir, but there is no credit given to that, and also, the way the figures have been computated may lead to believe that maintenance and reserves and other things are a part of the requirement, and what we tried to do is that given the resources that they have and if you subtract some of these years after '75-'76?

A Yes, sir.

Q In that particular column?

A Yes, sir.

Q Now, then, as far as your peak figures, shown in the second column, under group C, you've used the same peak figures there that you use over, insofar as your own CAI analysis, is concerned, in column D, isn't that right?

A Yes, sir, the same peak values that are used by the power company.

Q And that is the same as in Exhibit 5?

A Yes, sir.

Q Now, then, you've headed this particular column "Applicant Company's Analysis." Now, in that applicant company's analysis, they did not include the Bird unit insofar as average energy is concerned, isn't that right?

A Yes, but we felt that they should have included it.

Q I understand that, but go back to my question again. In Exhibit 6, which shows Montana Power Company's loads and resources, they did not include any average energy for Bird, did they?

A No, they did not, sir.

Q And you took it upon yourself to include that?

A The objective here in this --

Q Would you answer the question, please?

A I took upon myself what I thought was right.

Q Right. We understand that. Don't get me wrong, I'm not going after you for the method that you used here, but I'm saying that your procedure did not follow Montana Power's procedure, did it?

MR. SHENKER: Just a moment. The witness was interrupted in his answer. He's entitled to continue his answer and I'd like to hear the rest of his answer when he was interrupted.

Q I'm not sure that I interrupted. If I did, I'm sorry. Shall we start over again?

A Let me continue, on what I was to say before.

Q Fine.

A In the Applicants' Exhibits 5 and 6, as you presented them a moment ago, in these exhibits, they do include Bird for 64 megawatts. They include maintenance and reserve and all of the other factors that we have considered, and it is the different way of computation that they have given. They also include median water adder, which we have not considered in this particular thing, so what we tried to do is that given the resources as predicted by the power company, here is the figures which is compatible with the practice for energy resources and what will become of it and this is what the column C is.

Q When you look at Exhibit C, Bird is mentioned down at the very bottom, isn't it?

A Yes, sir, but there is no credit given to that, and also, the way the figures have been computated may lead to believe that maintenance and reserves and other things are a part of the requirement, and what we tried to do is that given the resources that they have and if you subtract some of these reserve requirements, which we have stated in my write-up -- I made it quite clear in my write-up.

Q Looking at Exhibit 6, Montana Power for the year '75-'76, carries, as far as average energy is concerned, total resources of 716, isn't that right?

A Yes, with the Bird. You are forgetting Bird, so if you consider 716 plus 64, which is 780 plus when you consider the median water adder -- here, what we are trying to do is that we are trying to compute the figures that you have given which is comparable with the approach that we have undertaken.

Q Yes, but your approach is not the same as Montana Power's, was it?

A The question boils down to this, how much of enough is enough and how many times you want to consider the minimum levels and how many times you want to consider the average levels and how many times you want to be conservative, and in computing these resources I felt, and I still feel, and many of my colleagues and people in the industry that I talked to before I started computing this thing, is that -- whether oil would be available or not, and whether it is logical practice to add median water adder and all of this practice, so what we tried to do, is, given the resources the power company has given, and then all of this other adders and other subtractors and other things that they have is, can we make a sense out of it, and this is what we tried to do in column C.

Q Now, I'll go back to my original question, Dr. Shah, and would you answer it, please? In Exhibit 6, Montana Power, for the year '75 and '76, has total resources of 716?

A This is the resources they have given. This does not consider the Bird unit.

Q That's correct. They did not include the Bird unit, did they?

A No, they did not.

Q Now, you have taken the Bird unit and added it to those figures?

A Yes, sir.

Q Now, your heading there, in Column C, under "Resources," you say "Applicant Company's Analysis." Really, that's your analysis, isn't it?

A Applicant company -- if you look at these figures, they do not present an analysis to me, because what they give you, the total resources, they left many things unanswered.

Q Yes, but --

A For example, Bird, they just put the number, and they did not say how that will affect median water adder; they did not say how it will affect, so what we tried to do is that given the resources as given by the power company, given the maintenance as given by them, given the interruptible loads, as given by them, given the other factors given by them, what do we compute, and this is what we tried to do, to develop our interpretation of the resources and the figures and the numbers that are given by the power company.

Q We understand that, Dr. Shah, but let's go back to my question once again. In that heading, you have "Applicant Company's Analysis" 732. That is not Montana Power Company's analysis, is it? That varies from their 716 figures, does it not?

A Yes, it does vary from the 716 figure, and I explained this.

Q You have done that, I think, on several occasions, but it does vary from the Montana Power Company's analysis?

A Yes, it does, sir, vary.

Q And you have headed that "Applicant Company's Analysis," haven't you, and really, that's your own analysis?

A No, this is the analysis which is based on the data given by the power company without using any of the operating availabilities or other factors that I described in my analysis, and again, this comes out juggling the numbers, when you compute the numbers one way or the other way, and the logical way we have done is the way that we thought was right.

Q I think you used a good phrase there, jumbling the numbers. Was that the phrase you used?

A I used the phrase, "juggling the numbers," and what I meant here is that the numbers that are given here in Exhibit 6 of the Applicants do not compute in a systematic way what is the net average resources. They give many numbers and this may look like juggling and I tried to put it in a proper perspective.

Q Well, we can say that you juggled the numbers, also, is that right, Doctor?

A Well --

Q Well, let's move on to the next column, surplus or deficit. There you have GAI and in the first column, you've subtracted D as the enumerator and B as the CAI forecast, subtracted B from D, to obtain those figures?

A That is true.

Q That is your own forecast and your own resources?

A That is true.

Q When you come to the next column under surplus or deficit, you've got applicant company, and you subtracted from C and C is applicant company's analysis, and from that, you've subtracted B, which is your own forecast, isn't that right?

A Yes, sir.

Q Wouldn't it have been more logical to have subtracted from that column A, the applicant company's forecast?

A What we tried to do is to rely on the forecast that we made, and since we analyzed five companies together, and since we are looking objectively, we relied that our forecast is correct, we assume that our forecast is correct; then, if there is a discrepancy in the resources of the applicants and of the consultant, that is us.

Q Well, you will admit that you have used your own load estimates in that last column, surplus or deficit, in both cases, haven't you?

A Yes, sir.

Q You have not used the applicant company's load estimate?

A We did not feel that that was the right thing to do. We relied on our load forecast.

Q So you assumed that your load estimate was better than theirs and that's the reason that you used it?

A We had more confidence in our forecast, that we made.

Q But at the heading up there, you've got "Applicant Company," you notice that, but really, as far as that B column is concerned, when you subtract B from C, really, that is not the applicant company, that's your own forecast, isn't it?

A It's our forecast, but the surplus or deficit obtained, using the resources as computed by the power company, without adding certain things that we discussed before.

Q Yes, so as a practical matter there, you've taken the applicant company's analysis, which you have changed somewhat, as you've previously testified for the reasons, and you've subtracted from that your own load forecast?

A Yes, sir.

Q And then you've headed that "Applicant Company," haven't you?

A Yes.

Q You have carried that procedure throughout in your analysis of the other four applicants, also?

A Yes, sir.

Q Insofar as Exhibit 212 series is concerned, isn't that right?

A Yes, sir, except that in Exhibit 212, we have given the total sum of all companies at the end instead of giving for individual companies a surplus or deficit in columns D minus B and C minus B.

Q So you've done the same thing?

A Yes, sir.

Q When you say C minus B, C is the applicant company's analysis and you have subtracted from that your own forecast, and you have not used the company's forecast?

A That is true.

Q You've been consistent in that respect throughout, have you not?

A Yes, sir.

Q Let's turn back now, to Exhibit 213, once again. Let's turn first to average energy and let's take a look at your own analysis, GAI analysis, surplus or deficit, in the first column, or columns, I should say, under surplus deficit heading. You have no deficit indicated until the year '79 and '80?

A That is true. This, again, does not consider the reserve.

Q Does not consider the what?

A I'm sorry, the reserve.

Q Then you have a surplus for the year '80 and '81, and you have a deficit in '81 and '82, do you not?

A Yes, sir.

Q Of 31?

A Yes, sir.

Q That deficit increases for the year '82 and '83 to 73 megawatts? We're talking in megawatts.

A Yes, sir.

Q And then that deficit for the year '83 and '84 goes up to 109?

A Yes, sir.

Q And then that deficit for the year '84-'85 goes up to 146?

A Yes, sir.

Q And I presume that if you had proceeded out for one more year, it would have gone up more than that, isn't that correct?

A I will presume that, yes. Again, I do not know the resources for that particular year, so I cannot say.

Q But based upon the other figures, we presume --

A Yes.

Q Now, then, as far as your own figures are concerned, you do show a deficit for the year of '79-'80 and for the years '81-

'82, and on through, to the end?

A Yes, sir.

Q That's average energy?

A Yes, sir.

Q As far as peak is concerned, I think you have, over on the complete righthand side, a peak surplus or deficit when you include reserves?

A Yes, sir.

Q And what year, and what deficit, do you have for the first year that any deficit appears in that righthand column?

A In the year '77-'78, a deficit of 94 megawatts.

Q And that goes down to 46?

A To 46 in '78-'79, 117 megawatts, in 1979-80, which goes down to 497 in '84-'85.

Q Each of those years, there is a deficit, however?

A Yes, sir.

Q Do you have one of the new exhibits, 6-B, Applicants' Exhibit 6-B?

A No, not at this time.

Q I thought perhaps this was one of the exhibits, perhaps, information you said that Mr. Shenker had sent you, that you didn't have time to look over?

A This is true, and I was not intending to --

Q Do you have it there now?

A No, I do not have it.

HEARINGS EXAMINER: Are you going to question him on this exhibit a little bit?

MR. BELLINGHAM: Yes, sir.

HEARINGS EXAMINER: Mr. Bellingham, at this time I'd like to take about a 10-minute recess and let him look this exhibit over. We have a gentleman, a public witness who is here, and we can take his testimony, and then he can go back to Great Falls, and this gentleman will have a chance to look at the exhibit, and before doing that, I think I'd like to put in the record, so it will explain what might seem to be confusing otherwise, that under our general rules of procedure, the Applicants were going to put in their case, and then public witnesses in support of their position, would appear to keep the thing in complete order. Therefore, on about the 2nd of February, after we had adjourned, I had written twenty some public witnesses and told them that they could testify on the 17th -- that's today. Then, when it appeared, as the proceedings progressed, that perhaps we could proceed and take public witnesses sooner, and that the DNR could start their case before you had really all completed your case, and to make a little more effective use of the time, we pushed up a lot of public witnesses last week, and we extended some this week, but there were still two or three that were scheduled, pursuant to my letter, to come today, and this is one of those gentlemen, so if the board reads this and wonders why it has been interspersed, it is because of trying to utilize the time effectively, rather than delaying and trying to put it all in a package.

(DR. SHAH STEPPED DOWN FROM THE WITNESS CHAIR TEMPORARILY.)

HEARINGS EXAMINER: Mr. Greytak.

JOHN J. GREYTAK, appearing as a public witness, having been first duly sworn upon his oath, was examined and testified as follows:

HEARINGS EXAMINER: Under our rules of procedure, if you speak as a proponent, what we call the opponents, have the right to ask you questions or cross-examine, or vice versa. I don't know whether you're an opponent or proponent, so in order for us to know who has the right to cross-examine, would you please advise us?

WITNESS: I guess I would be considered -- well, I'm for more electrical energy -- if that's a proponent -- yes, I would be a proponent for Colstrip, whatever it is, 3 and 4.

HEARINGS EXAMINER: Well, fine, the DNR will cross-examine you, but go ahead, and make your statement.

STATEMENT OF JOHN GREYTAK

My name is John Greytak. I'm from Great Falls. My address is 3211 12th Avenue South, and I am a farmer in the Valier area. I farm some 10,000 acres, of which I crop over 8,000 acres on a continual basis and irrigate some 7,500 acres with sprinkler irrigation, and I'm now developing another irrigated farm south of Tiber --some 2,500 sprinkler-irrigated acres, and I wish to talk to the committee today, really, just to try to focus you on the relationship between agriculture and electrical energy in Montana, from my viewpoint, and as I see it. I'd like to review for you and bring you up to date on just what electrical energy is required to irrigate an acre of Montana farmland for what we grow here, which is small grain. We're not a corn-producing country, we're a wheat-producing country. This irrigation development that I have in Valier, for example, it doesn't have any deep wells, as you'll find in Nebraska, where you're lifting water four and five hundred feet, so it requires much less electrical energy for the lift. We don't have a river three and four hundred feet at a lower level,as they do in the Columbia River Basin, where they're lifting water over the mountain to the flatlands. We have probably the most efficient use of electricity that you could have, so the numbers that I'm going to give to you regarding my place, are very conservative numbers, because most places in Montana that will be irrigated in the future are going to require a much higher lift of water than we had to in the Valier area, but for example, to irrigate 7,500 acres, we have 43 electric motors operating pumps, the smallest of which is 50 horsepower, and they go up to 150 horsepower. To make these circular pivots go around in a circle, we require 271 1 horsepower motor, so we have 314 motors, just in a farming operation. These are 440-volt. The point of all that is that irrigation occurs in a very brief time span, because when a plant needs water, you've got to give it to the plant, and our operation will require over 5,000,000 kilowatt hours of electricity during a 90-day growing period.

Now, you gentlemen are familiar -- I hear you talking about -- I don't know, some terminology that you were using --

it had to do with electrical energy, millions of somethings, but I just want to bring this down. I have 4,000 connected horsepower and I'm going to use over 5,000,000 kilowatt hours in a brief 90-day period. My operation at Tiber -- my engineer is projecting a use of 2,000,000 kilowatt hours, again in a 90-day period, and the gist of what I'm trying to head is, as I see it, and I'm sure as you see it, just by listening to the people in the United Nations, it seems like -- remember, when we were all back in school, they were talking about the Malthusian theory, and that's where the world population is going to outrace its food stuffs -- well, at least the way that I interpret the data that I can see, we seem to be entering the last few chapters of what would be his book, if he were to have written one.

According to the United Nations' ag and economic experts, they're making statements that by the end of the 1980's, the world supply of food will be so short as to cause nations to consider going to war with one another. Well, the areas of the world that can produce this additional food, are primarily in a rapid fashion, the United States --in a more leisurely fashion, Brazil, Bolivia, and part of Africa, have the proper climates and rainfall and soil characteristics to produce a lot of grain and a lot of food stuffs, but in the short haul, they're not going to develop Brazil or Bolivia. It's going to be the U. S. that's going to be looked to to provide a massive increase in grain production, and I submit that it's going to be the United States, and particularly, Montana. Montana is going to be under an extreme lot of pressure, because we have --

if you just reflect in your mind, when you're flying around Montana -- we have every other acre lying idle, as the population of the world starves, but as you fly along the Missouri River, the Yellowstone, the Tongue, and all the tributaries that go into them -- the Jefferson, the Madison, and so on -- you look down, and every other acre is in strip-farming, and this is a luxury that I don't think the world will allow us to afford. We're exporting our water downstream to whoever may or may not be using it, and we're only cultivating every other acre, and we're getting less than optimum yields on these acres, because the ones that are cultivated, had we put water on them, would get anywhere from 50 to 100% yield increases, so I submit, gentlemen, that in the next 10 to 15 years, the acreages near these rivers will be sprinkler-irrigated, and I'm talking about sprinkler irrigating like a hundred thousand additional acres per year. For fuller and more accurate information, I bring the Natural Resource people over here. They've got a lot of studies on irrigable acres, and it's a massive amount, especially if you sprinkler-irrigate it, versus flood irrigation, but just to give you some numbers again, for every hundred thousand acres per year that's put under sprinkler irrigation, there's going to be at least 70,000,000 kilowatt hours needed in 90 days, and I think that we're going to have a hundred thousand acres per year for at least the next ten years, right here in Montana. Well, that means there are going to be 700,000,000 kilowatt hours of demand during the months of June, July, and August, and I have no idea of whether Colstrip 3 and 4 can even supply this, so in wrapping up again, I think that Montana is going to be under a lot of pressure to produce grain in the short term, the next 10 or 15 years; to greatly increase our production of grains, it's going to require sprinkler irrigation. I think we're going to see something like a hundred thousand acres per year developed, and again, each hundred thousand acres requires 70,000,000 kilowatt hours if you don't lift the water. Now, we get down to some places along the Yellowstone, and you've got a couple of hundred foot lifts, and so you can add whatever -- 25% factor to those numbers.

That's all I have, gentlemen, and if there are any questions, fire away.

HEARINGS EXAMINER: Mr. Shenker?

Cross, by Department of Natural Resources and Conservation
By Mr. Shenker:

Q Mr. Greytak, have you chatted with anybody before coming down here, regarding the issues that we have in this proceeding?

A No, I'm just aware that you're for or against Colstrip.

Q I'm wondering if you inquired of anybody as to what the projected resources are in Montana and what loads they would service?

A No, I'm not aware of the excess electrical capacities or the shortages. I do know that in distribution lines, no electric utility is geared to support the kind of loads that agriculture demands.

Q What is the time frame in which you think that 700,000,000 kilowatt hours are going to be necessary?

A Ten years.

Q Do you know that in terms of average energy, as is computed by the folks who are applicants in this proceeding, that that amounts to 80 megawatts?

A No, I don't.

Q With respect to the energy that is required for sprinkler irrigation, would you not expect that the power companies, the applicants in this proceeding, and those who have expertise on the subject of demand forecasting, would certainly have to take that into consideration?

A I certainly think they should. I don't believe that they have.

Q Power companies have not?

A I don't think that they understand -- I don't think that in their calculations they have -- who knows, because I don't have their data for starters, but I know that when I try to work with utilities, I know how long it takes them to react, and I don't think they're forecasting properly. I don't think they know what's going to happen if we're pressed.

Q As far as you're concerned, Mr. Greytak, you are less concerned about where the power comes from than that the power be there, isn't that right?

A 100%. I couldn't care less where it comes from.

Q But in the overall picture, you would certainly want to have the power delivered to you with the least loss of the power on the way to you, wouldn't you?

A Correct.

MR. SHENKER: I have nothing further. Thank you, Mr. Greytak.

MR. PETERSON: I wonder if I could have an inquiry of this witness?

HEARINGS EXAMINER: Why don't you ask me, and I'll ask him.

MR. PETERSON: I'd like you to inquire of the witness as to who serves his ranching operation at the present time.

HEARINGS EXAMINER: That's a fair question. Where do you get your power from, sir?

WITNESS: We get it from Glacier Electric Utility out of Cutbank, who, as I understand it, in turn, buy it both from Bonneville and Montana Power Company.

MR. PETERSON: Thank you.

HEARINGS EXAMINER: Any further questions? (No response.) Thank you for your attendance, sir, and you're excused.

(WITNESS EXCUSED.)

HEARINGS EXAMINER: We'll now take a brief recess.

(BRIEF RECESS.)

After a brief recess, the hearing was reconvened at 10:25 A.M.

ROD HANSON, appearing as a public witness, having been first duly sworn upon his oath, both as to his written direct testimony and as to the oral testimony to follow, was examined and testified as follows:

(THE WRITTEN DIRECT TESTIMONY OF MR. ROD HANSON WAS DIRECTED TO BE INSERTED AT THIS POINT.)

SUN RIVER ELECTRIC COOPERATIVE
Box 217
Fairfield, Montana
February, 1976

STATE OF MONTANA
BOARD OF NATURAL RESOURCES

IN THE MATTER OF THE PUBLIC HEARING ON WAIVERS AND THE APPLICATION FOR CERTIFICATE OF ENVIRONMENTAL COMPATABILITY AND PUBLIC NEED FOR THE PROPROPOSED COALSTRIP PROJECT, UNITS 3 & 4.

My name is Rod Hanson. I am the Manager of the Sun River Electric Cooperative, with headquarters at Fairfield, Montana. The Sun River Electric is a distribution cooperative serving the electrical needs of some 3350 rural consumers in an eight county area surrounding Great Falls.

We are finding that the trend of only a few short years ago - when people were moving "out of the country" .. and into the urban areas .. has been reversed .. and that people are now moving back to the country. We are adding new consumers at a faster rate than we ever have since obtaining some semblance of area coverage.

We are constantly encouraging our people to conserve the use of electrical energy .. by shutting off extra lights, turning the thermostat down a few degrees - adding some insulation to their homes, using cold-water soap .. and all of those kinds of things which save kwhrs .. and, we find that many of them are doing this - BUT .. while they are saving a few killowatt hours through this effort of conservation - they are, on the other hand, turning to electric energy to do those things they used to do by other means. We are getting requests for electric home heating at a rate far in excess of what we have ever experienced before. People are either adding supplemental electric heating units .. or installing complete electric heating systems to replace the use of other types of energy. Practically all new homes are going to electric heat .. even in those areas where natural gas is readily available .. and others are converting from fuel oil and propane to electric heat. Our rural residential consumers increased their electrical usage by over 12% last year. This increase can be attributed to an increase of 3% in the number of consumers involved and increased usage .. a large portion of which was electric heat.

Another example of a rapidly expanding demand for electrical energy is in the field of irrigation. Sun River Electric has tripled the number of irrigation units served during the last 2 years .. from 50 units to 150 units .. and we already have over 30 signed applications for service to new irrigation units this year ... and the year has hardly begun. 1975 was a wet year - so we didn't sell as much electricity for irrigation usage as we did in 1974 - even though we had many more pumps installed - some 17% less in fact. BUT ..DUE TO THE INCREASED USAGE OF OUR RURAL RESIDENTIAL CONSUMERS OUR OVERALL PURCHASES WAS UP BY SOME 7%.

We purchase all of our power needs from Central Montana Electric G & T. The G & T is presently purchasing its' power from the Bureau of Reclamation and the Montana Power Company. Something like 58% BofR and 35% MPCo. - with the remaining 7% coming from the Bonneville Power Administration.

THE BUREAU CONTRACT PROHIBITS ANY INCREASE IN LOAD GROWTH AFTER OCTOBER 1977. The Montana Power contract provides for annual load growth .. by MUTUAL AGREEMENT .. on those points of delivery covered by contract.

So - at the moment, at least, our future power needs are dependent upon increased purchases .. by the G & T .. from the Montana Power Company.

We would like to see a greatly accelerated research program implemented, on both a state and national level, for the purpose of providing energy through the use of non-depletable resources such as solar power, wind power, geothermal power, etc. - [illegible] we must be realistic enough to know that this will take time .. and in the meantime we are going to need additional amounts [illegible] of electric power to meet the demands of our consumers - in the agricultural areas - if they are to continue increasing production of the food and fiber so essential to a growing nation .. and to replace or supplement other forms of energy that they now use .. if and when they become in short supply -(which really only seems to be a question of when).

WE KNOW OF NO ALTERNATIVE SOURCE OF ELECTRIC POWER THAT CAN BE BROUGHT ON LINE WITHIN THE TIME WE HAVE AVAILABLE. Our projections indicate a critical electric energy shortage.. for our loads .. by 1982 or 1983. We do not claim to know what the other power suppliers requirements are going to be - but if they don't have enough for their own needs .. we certainly cannot expect that they will take care of our needs .. through the mutual agreement clause of our contract - or otherwise.

For a good number of years those of us in the rural electric circles chided the private utilities for always being "TOO LATE - WITH TOO LITTLE" when it came to providing an adequate source of dependable electric power for the consumer. We have criticized them for being overly "PROFIT-MOTIVATED" .. rather than SERVICE ORIENTED. We felt that they were "regressive thinkers" rather than progressive.

During the 1971 session of the legislature we made an effort to do something about this "REGRESSIVENESS" .. The rural electric cooperatives in Montana joined with the organization called the "EASTERN MONTANA DEVELOPMENT ASSOCIATION" in the sponsorship of legislation which would provide the machinery to allow the creation of a "WHOLESALE ELECTRIC ENERGY DISTRICT".

The Chief Sponsor of this legislation (HB 534) was Represenative Bill Christiansen. His Co-Sponsors were Represenatives Weeding, Bardanouve, Knudsen, Lien, Edland, Hall, Eggebrecht, Zody, Lund, Ed Smith, Ulmer and East.

Sections 1 and 2(of the 27 sections contained in the bill) read as follows:

> Section 1. This act shall be known as the Wholesale Electric Energy District Act.
>
> Section 2. It is declared to be in the public interest and hereby found that a public purpose will be served by the creation of wholesale electric energy districts under this act to develop the natural resources of the state of Montana and to maintain therein a continuous and adequate supply of electric power and energy at the lowest possible cost through the construction and operation of electric generation and associated transmission facilities, thereby promoting the economic development of this state, and the health and welfare of its citizens.

The purpose of this proposed legislation, as I recall, was to provide the necessary language to authorize a "public body" to raise the financing for the construction and operation of a PUBLICALLY OWNED mine-mouth generating plant, fired by Montana's abundance of low-sulphur coal. This then would be a means of developing this Eastern Montana resource; providing employment for Montana people; assuring an adequate supply of reasonably cost wholesale power controlled by the people of Montana - rather than a private utility.

The large majority of the rural electric cooperatives supported that proprosal in 1971 .. and I am confident they still support the concept today. BUT, WE ARE THE ONES WHO WOULD NOW BE "TOO LATE" .. and possibly "too little".

WE JUST DON'T HAVE THAT KIND OF TIME .... ANY LONGER...

As many of you know .. I have never been an ardent supporter of the Montana Power Comapny. - I have disagreed, adamantly, with their method and mode of operation. I still do - and no doubt, will continue to do so on a large majority of issues....

However, in this instance ..we just don't have any alternative - time is of the essence .. if we are to avert an energy crisis in rural Montana in the early 1980's - . We must move forward NOW. Every week of delay is costing us dearly ... not only in time but in money.

FOR THESE REASONS WE URGE EARLY AND FAVORABLE ACTION OF THE REQUEST FOR CONSTRUCTION OF COALSTRIP UNITS 3 & 4 -- with the understanding, of course, that such construction meet the requirements of Montana law.

HEARINGS EXAMINER: Mr. Shenker, you may cross-examine.

EXAMINATION OF ROD HANSON

Cross, by Department of Natural Resources and Conservation

By Mr. Shenker:

Q Mr. Hanson, we've had a chance to visit with some of your colleagues in the REA and they've told us about their communications to come here to testify, so we appreciate your being here today, and I just want to ask you a few questions, if I could. Are you familiar with a fellow by the name of Paul Polzin?

A I don't believe so. P-o-l-s-i-n?

Q P-o-l-z-i-n. He's a professor at the University of Montana.

A I've heard the name, but no, I don't know him.

Q I was interested to see your comment that folks are moving back into the rural areas from the urban areas. An earlier witness, on behalf of a cooperative utility, had the same point of view.

A It's probably pretty apparent.

Q Do you think that's a general phenomenon now across the state of Montana?

A It is definitely, in our area.

Q How about across Montana?

A I can't truthfully say for some areas, but in our area, it's a definite trend.

Q What is the total average energy load expressed in kilowatts or megawatts that your company services?

A The total average?

Q Yes, sir, on an annual basis?
A On an annual basis for Sun River Electric Cooperative?
Q Yes, sir.
A It would be about ten, eleven thousand kilowatts.
Q Some ten or eleven megawatts?
A Right.
Q Have you supplied the data regarding your actual sales, the demands as you project them, and your resources, to the office of the Chairman of the Council on Energy Advice in Montana?
A No, we have not. They have not requested it, that I know of.
Q Oh, indeed. Are you the fellow who supplies data when somebody asks?
A We normally do, if they ask for it, if they have a legitimate request.
Q As I see in your statement, Mr. Hanson, you say that at the moment, at least, your future power needs are dependent upon increased purchases by the G & T from the Montana Power Company?
A That, at the moment, is the only thing that we have in the foreseeable future.
Q Are you at work looking for other resources?
A Yes, we are.
Q Where are you looking?
A We have a membership in the Basin Power Cooperative in North Dakota. We have a letter of intent with that -- now, I'm talking about through central Montana G & T --
Q Yes.
A -- a letter of intent with that organization, where we hopefully

could get power in the future. We know that the cost would be considerably higher, and there are many physical barriers that right now makes it real difficult to get.

Q Does your agreement with the Montana Power Company set the cost that you will have to bear for buying the power that they make available to you?

A Only so much as it does in any power contract.

Q So you have a negotiating factor with them, as you would with anybody else?

A Right, with approval by the Federal Power Commission, of any change.

Q And you also have, I take it, Mr. Hanson, the negotiation potential for any other power delivery source with which you can enter into an agreement, is that right?

A Providing the physical facilities would be available to deliver it.

Q You mean transmission lines?

A Right, which, as you know, in Montana, there aren't a lot of.

Q You're not interconnected with anybody else now?

A We are, through the Montana Power Company system.

Q So that the transmission lines of the Montana Power Company are used to wheel power to you as well as to deliver power to you?

A Yes, at all points of delivery on our system.

Q And if other power sources have power available, you would certainly expect to buy it from them, wouldn't you?

A Providing we could, and if the rates were right, and of course if that's all you can get, I guess the rates will have to be right

Q All part of the negotiation, isn't it?

A Right.

Q I notice in your statement, Mr. Hanson, you refer to the legislation that was introduced on establishing wholesale electric energy districts, and you note that Representative William Christiansen, now the Lt. Governor of Montana, along with Representatives Weeding and a few others -- Representative Weeding, I assume, is a member of the Board of Natural Resources and Conservation now?

A No, these people were all members of the House of Representatives at the time the bill was introduced.

Q But Bill Christiansen is now Lt. Governor of Montana, right?

A Yes.

Q And Cecil Weeding is now a member of the Board of Natural Resources and Conservation?

A I guess that's right, yes.

Q As I read your statement, at the bottom of page 4, I take it that you're in retrospect, looking backward, a little unhappy, perhaps, that the wholesale electric energy districts weren't created, because now it would be too late, is that right?

A Well, as I pointed out, the rural electric cooperatives in Montana have always tried to get more power available than what we have had, because we could see down the road to where we're going to have these problems that we foresee now, and at that time, we were happy to join in with this organization called Eastern Montana Development Association, I believe it was, to try to find a source of power that could be developed by the public. We felt that this would not only be a source of power that we would have available for us, but it would also be a source that could have the price controlled somewhat.

Q But you didn't do it?

A We didn't get it done. We tried.

Q You would have liked to have done it?

A This is right, and as you mentioned, Lt. Governor Christiansen and others did testify for this bill and fought hard for it, but --

Q And you did, too?

A Right, definitely.

Q The conclusion of your statement, Mr. Hanson, is that you have the understanding, of course, that the construction of these units should meet the requirements of Montana law?

A Yes, we believe that.

Q And one of those laws, I would assume, that you agree that the units should meet, would be the Montana Utilities Siting Act, now called the Major Facilities Siting Act?

A Yes.

Q You would expect the Board of Natural Resources and Conservation to meet all of those statutory requirements in considering these units, wouldn't you?

A Naturally.

MR. SHENKER: Thank you very much, Mr. Hanson; nothing further.

HEARINGS EXAMINER: Thank you very much. Your testimony will be received in evidence and go to the Board.

(WITNESS EXCUSED.)

DR. K. R. SHAH, having been previously called as a witness by the Department of Natural Resources and Conservation, and having been previously sworn upon his oath, resumed the witness stand for the continuation of his examination and testimony.

CONTINUATION OF EXAMINATION OF DR. K. R. SHAH

Cross, by Applicants

By Mr. Bellingham (continuing):

Q Well, where were we, Dr. Shah? I think I'd handed you, as I recall Exhibit 6-B and 5-B, is that right?

A Yes, sir.

Q Now, I'm calling your attention to 6-B. That's a Montana Power loads and resources for units 3 and 4. Incidentally, in your analysis, you have also excluded units 3 and 4?

A Yes, sir.

Q You'll notice in that particular exhibit, and I'm talking now about 6-B, Montana Power foresees a deficit of 38 megawatts in average energy for the year 1979 and 1980, isn't that correct?

A Yes, sir, this is what it shows here.

Q And that figure is the first year that they foresee a deficit, isn't that right?

A A deficit of 38 megawatts, yes.

Q Now, how does that compare with your figures?

A My figures show that in the same year, '79-'80, I have a deficit of 18 megawatts.

Q That is your own analysis on Exhibit 213 under the surplus deficit, isn't that right?

A Yes, sir.

Q And under the column, applicant company's surplus-deficit, you have a figure there of what?

A 29.

Q And that is a deficit, is that correct?

A Yes, sir.

Q Calling your attention to the year '80 and '81, Montana Power Company Exhibit 6-B has a deficit of what?

A 26 megawatts.

Q And your analysis, reflected in Exhibit 213, shows what?

A 7 surplus.

Q And what about your applicant company's analysis?

A It shows a 3-megawatt deficit.

Q Now, then, calling your attention to the year 1981-1982, you show a deficit of how much?

A A deficit of 31 megawatts.

Q And Montana Power, in its Exhibit 6-B, shows what?

A 71 megawatts.

Q And in Exhibit 213, in the applicant company's analysis, you show a deficit of how much?

A A 14-megawatt deficit.

Q And in '82-'83, your figure, I believe, in Exhibit 213, is a 73 deficit, is that right?

A Yes, sir.

Q And Applicants' Exhibit 6-B shows a 121 deficit?

A Yes, sir.

Q And you how in 213, under applicant company's analysis, a deficit of 40, is that right?

A Of 18, I believe.

Q Then, for the year '83-'84, you show a deficit of 109?

A Yes, sir.

Q Montana Power, in its Exhibit 6-B, shows a deficit of 167?

A Yes, sir.

Q And in your applicant company's analysis in Exhibit 213, you show a deficit of 115?

A Yes, sir.

Q '84-'85, you show a deficit in 213 of 146?

A Yes, sir.

Q And Montana Power in Exhibit 6-B, shows 216?

A Yes, sir.

Q And your applicant company's analysis in Exhibit 213 shows a deficit of 150, is that right?

A Yes, sir.

Q Now, would you please turn to Applicants' Exhibit 5-B, and that particular exhibit is headed Montana Power Loads and Resources for Annual Peak Excluding Industry, does it not?

A Now, I want to ask you one thing. You just want me to read this thing into the record, or do you want me to comment, also?

Q No, at this time, in order to speed the proceedings up, I'll just ask you the questions that I have done, as previously.

MR. SHENKER: If you're interested in speeding the proceedings up, Mr. Davis, all of this material is in the record already, and I don't know why we're reading it in again.

Q Turning now to Applicants' Exhibit No. 5-B, a Montana Power

Company exhibit, that shows an annual peak deficit for the first year of what?

MR. SHENKER: In the interests of expedition, since that's already in evidence, I think it is repetitive to read it into evidence again.

HEARINGS EXAMINER: Overruled; he can make whatever point he's going to.

A 9 megawatts in '81-'82.

Q And you show for that same year a deficit of how much in your Exhibit 213?

A I show 272 megawatts.

Q And exclusive of reserve, you show what?

A I show 26 megawatts.

Q And you show the same 26 in applicant company's analysis in Exhibit 213?

A Yes, sir.

Q Now, then, Applicants' Exhibit 5-B shows also, peak deficits for the subsequent years, '82-'83, '83'-'84, and so forth, out to '85 and '86, isn't that right?

A Yes, sir.

Q And your analysis in Exhibit 213 also shows deficits, is that correct?

A It shows a deficit up to '84-'85.

Q And that's the last period you've analyzed?

A Yes, sir.

Q And the same is true in the applicant company's analysis that you have set forth in Exhibit 213, is that correct?

A That is true.

Q Exhibit 5-B shows a deficit of peak. Since you did not use '85-'86, let's use '84 and '85, is that all right? What is the deficit in that for the year '84-'85?

A Exhibit 5-B shows the deficit as they computed it, to be 187 megawatts.

Q And you, in your Exhibit 213, foresee a deficit of how much?

A We see, based on the results given by the Northwest Power Pool and the load analysis that we have undertaken, we foresee a deficit of 497 megawatts on peak.

Q And as far as the applicant company's figures that you put together in Exhibit 213, what does that show?

A It shows 191 on peak on the applicant companies, and in our analysis, 191, without reserve..

Q As far as your figures are concerned in Exhibit 213, if Bird were taken out of your figures in that particular exhibit as a resource of 64 megawatts insofar as the energy columns are concerned, your deficits, as you have set forth under average energy, would be increased by 64 megawatts, isn't that right?

A Yes, if it is taken out.

Q And as an example, for the year of '79 and '80, if the Bird plant was taken out, you'd add 64 to the deficit of 18 that you have in that figure, and you'd come up with a deficit of 82?

A That is true, but I do not see the basis of taking it out.

Q No, I know you disagree with Montana Power relative to Bird. Fine, we understand that. Now, I would like to ask you if you have figured how many barrels of oil running Bird would take per year?

A No, I have not figured that; that was not part of my scope.

Q I realize that. How long would it take you to figure that?

A Well, I'd have to look at the standards and everything and I do not have how many units and barrels of oil and everything, so I can't do that at this time.

Q I now hand you Applicants' Exhibit No. 233.

HEARINGS EXAMINER: Is this a new exhibit?

MR. BELLINGHAM: Yes, sir.

Q Do you see what we have contained in there? We have put together in that oil requirements for the various forecasts that you have prepared for the five applicant companies for the year of 1980 and '81.

A Yes.

Q Rather than attempt to do it over the entire period --

A Okay, now you are going to five companies instead of one company?

Q Well, we have it tabulated here for all five companies. You see that?

A Yes, sir.

Q And for example, in the first group of columns there, we have average megawatt requirements, Shah, under Montana Power, show 64, isn't that right? We're talking here about oil for our generation.

A Yes.

Q You understand that?

A Yes.

Q So that figure for Montana Power of 64 is correct, isn't that right?

A Yes.

Q And the applicant companies show zero?

A Right.

Q So the difference is 64, as indicated there?

A Yes.

Q Then, the next group, we have barrels of oil per year, and the figures there, the explanation under that, is what, Doctor?

A It says that 17.5 --

MR. SHENKER: Mr. Davis, I object to offering an exhibit through this witness, which he obviously has not prepared, which has material on it that has been prepared by the Montana Power Company and others. They have their figures, they have their data. The witness has already testified that if he were to do computations, he would have to have standards, books, tables, and I think it is highly improper to ask this witness to comment on that exhibit.

HEARINGS EXAMINER: It sounds like a rebuttal exhibit to me.

MR. BELLINGHAM: We have contained in there, sir, the primary basis upon which the calculations can be made, and all I'm asking him is whether or not those figures appear reasonable.

HEARINGS EXAMINER: Well, that's correct, and I think you can cross-examine him. I thought you were offering the exhibit.

MR. BELLINGHAM: No, sir.

HEARINGS EXAMINER: I thought that's what you spoke to, Mr. Shenker, but as far as cross-examining him on the contents of something, if you want to question him about that, that's fine, go ahead.

Q Now, to get back to my question, do you see under barrels of oil per year, there is a tabulation there, isn't that right?

A Yes.

Q What does that read?

MR. SHENKER: Just a moment, Mr. Davis, this is going around Robin Hood's barn the wrong way. If this witness is going to be asked to read into the record the figures that have been prepared by someone else, then that puts into the record all of the figures before the exhibit can be offered. This is obviously a rebuttal type of exhibit, and it's rebuttal testimony. It's not for this witness to comment on when he didn't prepare the exhibit.

HEARINGS EXAMINER: I'm going to overrule. He can comment. We know he didn't make it. I'm going to go ahead and let you tell what you know about the exhibit.

Q Will you answer the question, Doctor?

A Yes. What it says is 17.5 billion barrels per kilowatt year, equal to 500 kilowatt hours per barrel. This is what it says.

Q Do you agree with that?

A As I say, before I agree, I would have to look at the standards for certain confirmation, myself, so I cannot say for certain.

Q Well, under the notes section here, it states "barrels of oil."

Do you see that?

A Yes.

Q And you see some standards there?

A Yes, I see that. Now, the question that comes to my mind is this: what kind of oil do you consider, whether it is 12,000 Btu or 8,000 Btu or 17,000 Btu, and that's the big question.

Q I've been informed that as far as these figures are concerned, a figure of 6,000,000 Btu's per barrel has been used.

A 6,000,000 Btu's per barrel?

Q Right. Does that strike you as an average figure?

A Well, it is used in some places. This is a hypothesis?

Q Yes, this is a hypothetical situation.

A That sounds reasonable.

Q All right, then, taking a look at the barrels of oil under notes down there, you'll see the formula that was used?

A Yes.

Q Does that formula look reasonable?

A Yes. The only thing is, it is deficient in one factor, and that factor is that it does not take into account the operating availability factor. If you recall, we say that looking at the resources, we allow for certain operating availability, on page 36 of my testimony, and this lacks that. This has used that the unit will be available 100% of the time, which is not the case.

Q Well, isn't the availability factor figured in the actual figures shown in the top column, for example, 64 megawatts? Doesn't that include the availability factor?

A Let me check that out.

(PAUSE.)

A Okay, yes, it does include it.

Q And you understand the basis upon which this particular requirement was made, do you not, or have you had a chance to examine it? Would you take a few minutes to examine it?

A Yes, I'd like to do that.

(PAUSE.)

Q Have you had an opportunity to examine it, Dr. Shah?

A Well, I tried to do the best I can. Let's proceed.

Q Do the figures look reasonable?

A The figures on the barrels of oil, the figures come out more or less the same, which come out to be 17.5 billion barrels per kilowatt year.

Q Well, have you examined the exhibit in its entirety?

A That is going to take time. I have to start.

Q Well, go ahead, I don't mean to rush you.

MR. SHENKER: Well, I do object to this, Mr. Davis. Here's a witness that is on the witness stand to be cross-examined on his direct statement. He's been shown figures for the first time. He was deposed in April of 1975. At no time has he been afforded the opportunity to look at this material. It is beyond the scope of the direct examination, properly, rebuttal testimony, and it is a dilatory tactic at this point.

MR. BELLINGHAM: I'm not attempting to slow down the proceedings at all. I assume that since Dr. Shah is an expert in the field, that he could examine this within a few short minutes and see if the figures are logical.

Now, if it's going to take a long time, that's something different.

HEARINGS EXAMINER: Well, I assume that you're cross-examining, basically, as to the Bird plant, which has been included in his, and excluded in yours, and I would certainly think cross-examination along that line is relevant, but maybe if you could just ask the questions rather than go through half the exhibit, as to what you're driving at -- I don't know whether you can or not.

Q Have you had a chance, Doctor?

A Yes, what I'm trying to do is to compute whether, under Montana Power Company, barrels of oil per year comes out to be 1,120,000 barrels or not. That's what I'm computing now.

Q We could find a calculator for you.

A Yes, that would be wonderful.

(CALCULATOR GIVEN TO WITNESS -- PAUSE.)

A I am getting pretty close to --

Q So in the second group, barrels of oil per year, the figure of 1,120,000 barrels of oil to be used per year for the Bird plant appears reasonable, based upon your 64 megawatts?

A Yes, sir.

Q The next column down there comments on the cost of oil per year, and there the figure from Montana Power is $13,440,000. Does that figure appear reasonable?

A Yes, that looks reasonable.

Q We're assuming here a cost of $12.00 per barrel.

A Yes, sir.

Q And that figure does appear reasonable, does it?

A Yes, the mathematics is correct.

Q I'd like to next turn our attention, if I might, to Washington Water Power Company figures that are contained in your written statement.

A Which page?

Q Let's first establish what exhibits were used in analyzing Washington Water Power Company loads and resources as you have done.

A This is Exhibit 212?

Q We'll start off at Exhibit 205, which indicates your analysis of their loads, does it not?

A Yes, Exhibit 205 shows that analysis.

Q And Exhibit 210 shows the resources as you have analyzed them?

A Yes, sir.

Q And in the various exhibits, 212-A, on through the end, that includes your analysis of the loads and resources of Washington Water Power, along with the other companies?

A Yes, sir.

Q Now, then, in Exhibit 205, if you'll turn to that, please, your estimate for Washington Water Power's residential sales increases by 132 in 1976, does it not?

A Compared to what?

Q Well, over the previous year.

A By 133 million kilowatt hours.

Q And for the year '77, the increase over the year 1976, is how many million kilowatt hours? I think it's 137.

A 137 million kilowatt hours, right.

Q Now, then, as far as the year of 1978 over 1977, you show a figure, I think, there, of increase, of some 83,000,000 kilowatt hours? I wonder if you would check that?

A That is correct.

Q And then when we go into the year 1979 over 1978, you show a 201 increase?

A Yes.

Q My only reason for bringing these up is to ask you if, in fact, that figure for the year 1978 may be incorrect being 83 in kilowatt hours, when you compare that with 132, 137, on previous years, and 201 for the subsequent year?

A Okay, this is what it comes out in our analysis, and this is what we have put down.

Q But I wonder if maybe that figure for the year 1978, as applied to residential, may be incorrect?

A No, this is what it comes out, and this is what we have put down.

Q Where did you get that figure?

A Well, what we did here is as explained in our estimate. We estimated, based on the number of customers and the energy consumption and based on the prospect of the future.

Q All right, fine. Then you stand, as far as those figures are concerned?

A Yes, sir.

Q Now, turn your attention to Exhibit 210. You have a resource there entitled "Other," and I assume -- rather than assume, let me ask you, what is that? I think it's perhaps the Othello combustion turbine, if I might direct your attention to that.

A Let me check. (Pause.) Yes.

Q And that's a combustion turbine, isn't it?

A Yes.

Q And you show as a resource, 26 megawatts for the entire period, is that right?

A Yes, sir.

Q How much, as a resource, did Washington Water Power, in its exhibit, show, the figures given to you?

A It shows 33 megawatts on peak and one megawatt on energy.

Q We're talking about average energy, are we not?

A One megawatt.

Q So it shows one megawatt, and you show 26 megawatts, is that right?

A Yes, right.

Q I think you've mentioned in your written statement that burning oil for electric energy generation is not really consistent with the national energy policy of reducing the consumption of oil, particularly for the use of generation of electricity. You've referred to that, haven't you?

A I know the exact wording that I put down, and let's look at that.

Q I think it's under Montana Power --

A On page 36, line 21. "We are quite aware of the Federal Energy Administration policy to discourage the operation of the oil-fired units which were originally converted from coal to oil," and it does not say anything about the oil-fired units and the restrictions by the FEC.

Q Do you know whether Washington Water Power can obtain sufficient oil to use this combustion turbine as an energy resource over this period of time and as a base load?

A No, I do not know. This was not part of my assignment, to find out whether they can get this much oil energy, or from where they can get it.

Q You are familiar with the situation presently as far as oil is concerned, are you not?

A I'm familiar that the directives given by the FEC in connection with the oil-fired units are to let them burn the oil, unless they have converted from coal to oil. Again, every region is different, every company is different, and they have many, many volumes of the directives.

Q We know there is an oil shortage?

A In general, yes, but the other person would be better able to address this particular question of not sufficient energy than me, because this was not part of my assignment.

Q That's right, I recognize that fact, but it is possible that during this period of time Washington Water Power may have a difficult time in obtaining a sufficient supply of oil to run that?

A If they have difficulty, then it's a different story; then they can take this out.

Q Pardon?

A If they have difficulty, if the government requres them, then it is a different story.

Q That is a possibility, is it not?

A Well, I don't want to stipulate on that.

Q I realize you don't want to stipulate, but there is that possibility, it could happen in the future?

A Yes, there are many possibilities that can happen.

Q Yes, and this is one of the possibilities?

A Yes, and there is a strong possibility that they can also get it, because if they are energy-deficient and if they don't have other sources of energy, then oil is the other source of energy that is available, and government can re-look at the resources and give them energy.

Q Well, let's call it a draw, shall we? There's a possibility they can't obtain it, and there's a possibility they can, isn't that right?

A Yes.

Q Okay, we agree on that. Now, then, I'd like to call your attention once again to Applicants' Exhibit 233, and you will notice that for Washington Water Power the average megawatt requirements in the first group, we have the figure of 26 after your name. That figure is correct, isn't it?

A Yes, sir.

Q That's the resource in megawatts that you attribute to this particular unit?

A Yes.

Q And the applicant companies have a figure of one megawatt?

A Right.

Q And the difference there is 25?

A Yes, sir.

Q Will you take a look at the next two columns, and hopefully, on the basis of what you did on Montana Power, would you take a look and see if those figures are correct?

MR. SHENKER: Mr. Davis, I will object to this arithmetic method through this witness. We've been going through a lot of arithmetic. The exhibits should speak for themselves. We are now referring to an exhibit that is not in evidence, is properly a rebuttal exhibit. If it is correctly put together, someone, some day, will testify to it if it's relevant, but we're now asking this witness to do arithmetic, and that's a waste of everybody's time.

HEARINGS EXAMINER: Which number?

MR. SHENKER: 233.

MR. BELLINGHAM: He did the same calculations for Montana Power, sir, and I think it will only take a moment or so.

MR. SHENKER: It's a waste of time.

HEARINGS EXAMINER: Overruled, you may go ahead.

A It looks reasonable.

Q Now, I'd ask you, sir, whether the Washington Water Power Company figures in Exhibit 233 appear reasonable.

A The figures that are given, right.

Q And the indications are that that unit will burn 455,000 barrels of oil per year?

A This is with 26 megawatts?

Q Using the 26 megawatts, and as far as using one megawatt, as Washington Water Power sees it, it will burn 17,500 barrels?

A Right.

Q And the difference here is for 137,500 barrels?

A Yes.

Q Going down now to the cost of oil per year, the cost there, as to your figure, 26, is $5,160,000, is that right?

A Right.

Q And the cost for one megawatt is $210,000?

A Yes, sir.

Q A difference of $5,250,000?

A Yes, sir.

Q Doctor, is it your understanding that the national energy policy calls for reducing the generation of electricity from oil and switching from oil to coal as a boiler fuel wherever possible?

A Yes, sir.

Q That is true?

A Yes, sir.

Q I don't want to unduly take up more time than is necessary, but I think perhaps I can ask you a few basic questions relative to Washington Water Power and not go into the detail of it as we did with Montana Power. First of all, as far as Washington Water Power Company statistics and figures that you have contained in your exhibits, you do not have a summary for Washington Water Power as you did for Montana Power in Exhibit 213, do you?

A No. As you can read the approach that we have given on page 3, Method of Analysis.

Q Explain the background.

A Okay. What we have done is that we have considered five companies acting as one in planning the facilities, so we have considered their loads, their resources, and the results as required by the Northwest Power Pool, and then, since Montana Power Company was the leading company undertaking the application of the Colstrip project, we analyzed that company separately, so I have the two scenarios.

Q Right, we understand that, and in your exhibit series, 212, you have for each company, given the load and resources, as you have forecast them, with the surplus or deficit, isn't that correct?

A Yes.

Q And I am not going to go through each year, but let's take a look at Exhibit 212-F and center our attention upon a single year. Does that sound reasonable to you?

A Well, whichever you want to pick.

Q Let's use '80 and '81. Is that all right?

A That's fine with me.

Q Now, then, under load A, you've got applicant companies' forecast. Now, for Washington Water Power, you've got the figure under average, of 911?

A Yes.

Q And where did you obtain that figure?

A Okay, you can go back in my analysis of Washington Water Power. I have said that the contract sales to the other customers cannot be considered as load. It is considered as a depletion of the resources, so what we have done is, that we have taken from their loads and reduced it by the contract sales as far as the loads are concerned and this is what 911 comes out to be.

Q Well, do you have the old exhibit that Washington Water Power originally introduced?

A Yes.

Q What number do you have, sir?

A March 6, 1975, which has got 911 load.

Q I think that exhibit is a 20 series, 20, 20-A, and so forth, and if I can, call your attention to Exhibit 20-B, which I'll hand you. This was the old exhibit that they introduced, and I'm wondering if, in that exhibit, for the year of 1980 and '81, you see any correlation with the figures?

A Yes, sir, I can see the 1980-'81 loads of 911.

Q So you did take that, basically, then, from the previous exhibit, 20-B, that Washington Water Power introduced?

A I just considered the system firm load and did not consider the contract sales.

Q Why didn't you do that?

A I explained that in my --

Q All right, fine. Then, as far as peak is concerned, what figure did you use?

A 1578 and it is the same figure that comes under column 1980-'81 as tc firm loads.

Q In the Exhibit 21-B?

A 20-B.

Q 20-B, excuse me, and you explain that?

A I explain that contract sales are not a project need; instead, they can be considered by reducing from the resources, so what we have done is adding 2 plus 5 equals 7 and what we have done is a 9 minus 2 equals 7. In load resource analysis, the values remain the same.

Q Calling your attention to B, under "Load," this is the figure that you arrived at in your own analysis?

A Yes, sir.

Q 893 for average energy and 1547 for peak?

A Yes, sir.

Q Turning to the resources column, under (C), applicant companies' analysis, you have the figure of 805. Now, where did you obtain that figure?

A Okay, this is the figure from the resources that they have given us.

Q Look at Exhibit 20-B, if you would, please, and see how you correlate that. May I call your attention quickly, maybe to speed things up -- that particular exhibit includes Colstrip. Will you notice that?

A Yes.

Q For '80 and '81 --

A Yes, sir.

Q And I would assume that you subtracted that?

A Yes, sir.

Q Well, anything else? Well, to speed things up, it looks as though the Colstrip figures, 136 and contract sales, up above, 85, if we add 136 and 85, we get 221, and if you subtract that from the figure they have used of 1026, I think the figure comes out 805?

A 805, right.

Q That's the figure that you have under resources?

A Okay.

Q Goody, we came out with the right figure, didn't we?

A Well --

Q Turning next to resources, under applicant companies' analysis, 1580, and comparing and looking at Applicants' Exhibit 20-B again, how did you arrive at that figure?

A What we have is total resources, 1947, contract sales, 157, Colstrip 3, 105, and Colstrip 4, 105, so if you subtract from 1947, 157, 105, and 105, you come up with 1580.

Q All right, fine. Now, then, in your analysis, column D, these are the figures that you base your analysis -- at which you arrived as a result of your analysis?

A Yes.

Q When we go on over into the surplus or deficit, you do not have it on an individual basis, do you?

A No. The reason is that what we want to consider is that each of the five companies working together as a team member -- everything as one -- what is their total resources, what are their total loads, what is their surplus or deficit?

Q Well, insofar as obtaining the figures for the individual companies, it would be very easy to project that in the space that you have provided over on the righthand side, isn't that right?

A Well, it was meaningless, because what we are looking at, is five companies together.

Q Right, I understand that, but if we wanted to figure out the projection that you have of each individual company for any particular year, we could very easily do it from Exhibit 212, couldn't we?

A Yes, but what would be gained?

Q Well, that isn't what I'm saying; I'm just asking if we could do that?

A Yes, you could.

Q I'd like next to turn to Portland, if I might, and first of all, Portland General Electric Company. I'd like to call your attention to the various exhibits that you have here that pertain to Portland. In order to speed it up, I think Exhibit 203 indicates your load forecast, does it not?

A Yes, sir.

Q 208 indicates the reserves as you have figured them?

A Yes.

Q Rather,the resources?

A Yes, sir.

Q And the group exhibits embraced in the figure 212, gives your load resources as you have analyzed them, is that right?

A Yes, sir.

Q Now, then, let's take a look, if we can, at Exhibit 212-F. This is the operating year of '80 and '81, for Portland General Electric. Now, under the load, you have under column A, applicant companies' forecast, an average of 2257. Now, where did you obtain that?

A This is the value that was given to us as the applicant company's load, and I am looking at the data that was supplied to us when I was visiting Portland General Electric.

Q Let me hand you Applicants' Exhibit 19. Do you find any correlation between that?

A This is not the same as was given to us.

Q Well, perhaps we can shorten it. Exhibit 19 shows an energy load of 2272?

A Yes, and we have been given 2257.

Q Right, and the figure you used is 2257, not a very great difference, and I assume that what's happened here, since this particular exhibit was prepared back in April of 1975, as indicated in the lower righthand corner, I assume, those were the figures that were given to you. Does that make sense?

A This figure was given to us, yes.

Q Now, turning your attention to the load figure there of 3850, and comparing that with Exhibit 19, it is the same?

A They're the same.

Q So you used that same figure, is that right?

A Right.

Q And then, in column B, is your forecast, as you have prepared it, isn't that right?

A Yes.

Q And as far as resources are concerned, you've got applicant companies' analysis at 2075. Now, looking at Exhibit 19, how does that correlate?

A You want me to go through this 19-A?

Q No, I don't want you to compute it, but do you see any correlation in 19?

A In 19, they give the various values for the hydro and then they give the results, but they do not give the total computation or the total sum.

Q Well, how did you arrive at this figure of 2075?

A Okay. One of the things that we found out, just like you brought out before, about the use of oil and the use of combustion turbines and the number of barrels of oil that a turbine has to burn, in that particular regard, what PGE has done is that in some years, for example, in '79-'80, they have bought a combustion turbine load of 650 megawatts. Now, when you go to '80-'81, somehow they don't want to use combustion turbines because of other units being available, and they are using in '80-'81, a small fraction of the megawattage, which is -- if I compute here -- it is about 400 megawatts -- and we used about 650 megawatts in computing the resources, because if they can use it in'79-'80,650 megawatts, then we don't see any reason why they cannot use the combustion turbines of the same capacity if it is available in 80-81 and subsequent years.

Q You've used the figure for '80 and '81 of 650 megawatts as a resource?

A Right, because PGE is willing to buy the oil that we talked about before, in running these combustion turbines.

Q If it's willing and if the oil is available?

A If the oil is available, and they have put down in '79-'80 -- as a matter of fact, they have put down in '78-'79, more or less the same capacity, so if they can do it in those years, I don't see why they can't do it in subsequent years.

Q Well, take a look at Exhibit 19, would you, please? I think under combustion turbines for resources, you will see a figure that they have used there for the years of '78-79 and thereafter of 293?

A Yes, they have used it.

Q As a resource?

A As a resource, but not 650 megawatts, as we have used it.

Q That's right, so that explains the difference?

A That explains the difference, yes.

Q Right. Now, then, that's in Exhibit 19. I'd now like to call your attention to Portland's latest exhibit that was introduced, that supersedes the previous one, 19, that we have talked about here.

A Let me give you this back, okay?

Q That is Exhibit 19, dated 12/23/75. I'd like to hand you that.

A I do not have this exhibit with me.

Q I understand. That's one of the new exhibits that went in, and calling your attention there to their resources as far as energy is concerned, they have, as far as combustion turbines are concerned, the figure of 73 for the years of '77-'78 through '86-'87, have they not?

A Yes, sir.

Q And during those years, you used the figure of 650?

A Right.

Q They have not included that in the figures above, have they?

A No, they have not, but in later years, they did, in the exhibit that we had. They did include that.

Q Calling your attention now to the peak figures in column C of 4730 for Portland, where did you obtain that, do you know?

A This is the figure that we computed, based on the graph that they gave us.

Q Can you correlate that with Exhibit 19 at all?

A Well, I can try. I guess we have been coming out right well, right? Let's look at it.

(PAUSE TO REVIEW DOCUMENTS.)

A I have read all of these numbers now here, but are we here in the peak area? Here it is, 4730, and you want me to compute all of these numbers?

Q Well, do you think it correlates with Exhibit 19?

A Well, I have to go to every detail, because I do not have the advantage that you have, that all of these things have been calculated. I have to look back and measure everything and then come up with this estimate.

Q How long would it take you?

A Well, it will take at least 10 to 15 minutes.

Q Oh, well, now, let's not go in to that, but anyway, that figure, 4730 is a peak figure that you have calculated from the figures that they submitted to you?

A Right.

Q And column D, under resources, are the resources as you have indicated previously, that you figured out?

A Yes. Our peak resources are the same as the applicant company resources that were given to us.

Q Do you know of the problems that Portland has had relative to the use of their combustion turbine?

A No, I don't.

Q Has that ever been explained to you by Mr. Bredemeier or by anybody else?

A As I recall, this is my recollection, that this was not explained to me, but this is my recollection, yes.

Q And you don't recall having asked them about the problems in connection with the combustion turbine?

A No, what I did, I asked them, not particularly with the combustion turbine engine, but what do you anticipate the abilities in your units, so I can factor this, correspondingly.

Q All right, fine.

A And this implies that they should respond in terms of combustion turbines, also.

Q Well, you don't recall any response relative to their problems, is that right?

A He give me certain things, and he say to check with Pacific Power and Light and certain units which they had in common.

Q All right, fine. Do you know where their combustion turbines are located?

A No, I do not.

Q Bethel, Beaver, and so forth; those names mean nothing to you?

A No. That was not part of my assignment, to determine which sides they are located and the size of their problems.

Q Are you aware of the fact that they have obtained permits in Oregon to run these combustion turbines?

A No, I do not.

Q You do not know anything about the problems they have?

A I do not know anything about the environmental problems.

Q Well, let's take up the well-known old favorite, Applicants' Exhibit 233, again.

A Okay.

Q And I'd like to call your attention there to --

A The number of barrels of oil and the cost of the oil.

Q Right. Portland GE figures -- now, in the first group, you have Shah, 650?

A Yes, sir.

Q That's 650 megawatts that you have used for base generating purposes average energy?

A Yes.

Q The applicant company's figure is 73, and that is based upon the new Exhibit 19 that you have previously seen?

A Yes, sir.

Q And the difference there is 577, is that correct?

MR. SHENKER: Mr. Davis, we are now on the third set of arithmetic exercises, which I believe to be extraneous and redundant in the extreme. I see no purpose in continuing arithmetic. I object to the question as put.

MR. BELLINGHAM: If it will help Mr. Shenker, this is the third, and that only leaves two more, and I think on the basis of Washington Water Power, it's only going to take a minute or two, sir, to get the information.

HEARINGS EXAMINER: Well, why can't he represent what the calculations are, if that's what the difference is, without him having to do the math? It might speed it up a little bit.

Q Do those figures appear reasonable, then, sir, insofar as Portland GE is concerned?

A It looks reasonable.

Q And the barrels of oil per year is indicated on your projection as 11,375,000, is that right?

A Right.

Q And the applicant companies' is 1,277,500?

A Yes.

Q A difference of 10,097,500?

MR. SHENKER: Mr. Davis, I'm prepared to stipulate on behalf of the Department of Natural Resources and Conservation that Mr. Bellingham knows how to read those figures into the record, and I don't see any purpose in our doing it further.

HEARINGS EXAMINER: Would you also stipulate that what you're driving at, I assume, is they've not considered the oil-fired in their calculations, which would cost so much money for the oil-fired, and that's what you're driving at on each one, isn't it?

MR. SHENKER: I think that's perfectly clear, and the exhibit will have to speak for itself.

HEARINGS EXAMINER: That in each instance, they haven't considered the oil-fired or the cost of the oil, and that's what you're going to put into evidence anyway, isn't it?

MR. BELLINGHAM: That's right, sir.

Q Do those figures appear correct?

A It looks reasonable. I can multiply and everything, if you want me to go through that.

Q How long would it take?

A Well, depending on the time it would take to do this calculation.

Q Well, just let me ask you if the figures do appear correct?

HEARINGS EXAMINER: Ask him to assume that the figures are correct and then he can go from there, if you want.

MR. BELLINGHAM: Well, I've got the answer that they are correct, without having to go any further.

Q Now, then, let's take Pacific, if we might. Now, calling your attention to --

A Pacific Power and Light.

Q Yes. Calling your attention to your exhibits, I think in Exhibit 206, you give the loads that you have figured, is that right?

A Yes, sir, 206 and 206-A.

Q And figure 211 gives the resources?

A Yes, sir.

Q And the Exhibit 212 series give you the loads and the resources?

A Yes, sir.

Q Now, calling your attention once more to the year of '80 and '81 in Exhibit 212-F, you have, under column A, applicant companies' forecast of average energy, the figure of 2763?

A Right.

Q Do you know how you obtained that figure?

A This is the figure we obtained from the power company.

Q They gave you that figure?

A Yes, sir.

Q And is the same true as far as peak is concerned?

A Yes, sir.

Q And because Pacific did not have a consolidation of their loads and resources in an easily presented exhibit originally, there is no exhibit that I can refer you to on that, so turning next to column B, that is your forecast for average energy and peak, is it not?

A Yes, sir.

Q And now we come to resources in column C, applicant companies' analysis, and you have there a figure of 2858, is that right?

A Yes, sir.

Q And how did you obtain that figure?

A This is given to us by them.

Q Incidentally, do you have the worksheet that they gave you?

A Let me check.

Q For the year '80 and '81?

(PAUSE.)

Q Do you have the printout of the computer runs?

A That is what I am looking at now.

Q All right. For the year '81, doesn't that worksheet show 3019.3 for average energy?

A Yes, it does how that. What we have is that there is something like 9.8 megawatts in contracts, miscellaneous contracts, and there is --

Q Isn't there a figure there, also, of 74.9, for withdrawals, mid-Columbia Basin?

A Let me check here. How much did you say, 74.9?

Q Right.

A It doesn't have it in mine, unfortunately. I don't see that. In '80-'81?

Q Yes.

A I don't have that.

Q There is supposed to be a figure of 74.9 withdrawals, mid-Columbia Basin.

A Withdrawals, okay.

Q So it does appear in there, does it not?

A Right.

Q And less Colstrip, 86.2 -- I assume that you did that?

A Right.

Q Now, then, you did not include in your figure any allowance for thermal maintenance, did you, on the worksheet?

A What we considered is that, as far as the applicant companies are concerned -- right?

Q Yes, as far as this company, Pacific, is concerned, don't they have a thermal maintenance allowance of 189.8 megawatts for that year?

A Let me check it out.

Q I think you would find that on the same worksheet.

A Yes, it is there, but what I want to know is why we did not consider that, whether there were some other factors.

(PAUSE.)

Q Well, can't you figure from your calculations whether or not you did include or allow thermal maintenance? How does it appear, that you did, or did not?

A We have considered the thermal maintenance, as far as I can see, on these units. I have here some numbers.

Q What are those figures?

A Here it says that thermal maintenance is 184 to account for Colstrip 3 and 4, so without Colstrip 3 and 4, I am looking at the numbers now.

Q There's no indication that you did deduct this particular item, is there?

A Let me check before I say it. I am sure that we have included these things, the numbers, and let us look.

(PAUSE.)

A It does include the maintenance. Let me explain to you what I did. Peak, 19.

Q Right.

A Subtract 9.8 and 45.3, which is wells, w-e-l-l-s, and then subtract 75, approximately; then you come up with about 2830, approximately.

Q Well, now, isn't it possible that you did it this way, that you took 3019.3 and subtracted 161.1 from that, which would be less the Colstrip units of 86.2 and 74.9, resulting in a figure of 2858, as you have, on your Exhibit 212?

A Say it again, now.

Q Well, you start off with a figure of 3019.3.

A Yes.

Q You subtract from that 74.9 withdrawals, mid-Columbia Basin, and then less the two Colstrip units, 86.2 and 74.9, and that comes out with your figure of 2858.

A Right. We did not consider maintenance, and the reason we did not consider it is that we only discounted the maintenance effect by putting availability factors -- for example, we put down 66.7, or 50% of 47.5% in Jim Bridger. 1, 2, 3, 4, in the year '76-'77 to '79, and there was no point in considering again the maintenance megawatt.

Q So you think that was included, then, in your other figures, as far as the maintenance is concerned, the deductions?

A Will you repeat that again?

Q Well, that was taken into account in your other factors?

A As I recall now this process, maintenance only is taken into account in those figures.

Q Moving next to your resource column, Column C, where did you get that figure, 5601?

A This again, is a figure that is given to us from Pacific.

Q How much of Pacific's resources are made up of turbines?

A Well, I will have to go back and see which one is made up of turbines.

Q Your Exhibit 211 would show that, would it not?

A It shows the name of the unit.

Q I think the figure is 13.8, and I think that's Trona, does that ring a bell with you, looking at Exhibit 211?

A Yes, right.

Q You have used the figure 13.8 there?

A Yes, sir.

Q As a resource, have you not?

A Yes, sir.

Q Do you know what Pacific carries as to that particular resource?

A You mean what is the Pacific Power and Light -- ?

Q Yes, what figure do they carry compared to your 13.08?

A Okay, let me look. You're talking of peak now, right?

Q Pardon?

A We are talking of peak now, here?

Q No, sir, we're talking about average energy.

A Okay, let me just make it sure. Somehow, I do not have that figure we are talking here, and I do not have this in my exhibit, 10 megawatts for Trona. I do not have this in my exhibit.

Q What exhibit are you talking about?

A The exhibit that was given to us by the power company, and I do not see 10 megawatts for Trona.

Q What number exhibit are you talking about?

A Well, I don't have any numbers. This is the one that they presented to us.

Q Well, if I were to represent to you that that figure of 10 is used by them, you would not be surprised?

A I would not tell you that this is right or wrong, okay?

Q All right. At page 26 of your testimony, you indicate there, at line 12: "Pacific Power and Light Company projects total system energy sales in MKWH by estimating energy sales of each of the major regions in PP&L's service territory." Now, in your analysis here, you state that they do project total system energy sales as far as their future loads are concerned, isn't that right?

A Yes.

Q Would you be surprised to find that Pacific actually does not use these sales figures in projecting future loads?

A These are the numbers, and this is the impression they give, and I would be very surprised and shocked if this is the fact, because the data they have given us is this data, and I would be shocked if this is a fact.

Q All right, then, let's turn to Puget. Are you with me?

A Yes, sir.

Q I think in Exhibit 204 we have the load forecast, is that right?

A Yes, sir.

Q And the figure 209, we have the resources, is that right?

A Yes, sir.

Q And Exhibit 212 has a combination loads and resources adjusted to the other companies, is thst right?

A That is true.

Q Now, then, let us turn to 80 and 81 once again as far as Puget is concerned and as far as the load in column A is concerned, where did you get the figure of 1785?

A This was in the information supplied to us.

Q Do you have the old Puget exhibit?

A I do not know whether it is old or new, but this is the exhibit they gave me.

Q Well, I'm referring you, actually, to Exhibit 18-B.

A No, I do not have that number. This is the information that was given me.

Q Does that have in the lower righthand corner have a date of 3/31/75?

A No, I do not have any dates.

(MR. BELLINGHAM HANDS WITNESS DOCUMENT.)

Q Would you compare this?

A No, this is not the same thing, because I do not have this asterisk in my information, which says that "since the preparation of this table for WGF, the schedule date for scheduling has been changed to May '85." I do not have that in my exhibit, and now I'm checking the numbers here. I'm looking at other things, also.

Q Well, let me call your attention, if I might, to Exhibit 18-B, that you have.

A Yes, sir.

Q Dated 3/31/75 --

A Yes.

Q Do you find on there, and I'm calling your attention specifically to the year 1980 and '81, a figure of 1785?

A Yes, sir.

Q So that does appear upon that exhibit?

A Yes, sir.

Q And you also find a peak figure there of 3104?

A Yes, sir.

Q And that is the one that appears in paragraph (A) of your Exhibit 212-F?

A Right.

Q Now, as far as Exhibit B is concerned -- or column B is concerned -- those are your figures, are they not?

A Yes, sir.

Q Now, as far as resources are concerned, you have, under applicant company's analysis, a figure of 1502 for average energy, do you not?

A Yes, sir.

Q Calling your attention to Applicants' Exhibit 18-B, dated 3/31/75, do you find any correlation as far as that figures is concerned?

A This includes the No. 3 and the No. 4, this exhibit, and our resources do not include that.

Q Does that account for the difference?

A Well, do you want me to compute again?

Q Yes, would you, please?

(PAUSE TO COMPLY.)

Q It comes out to exactly 1502 when you subtract from the total resources figure, the average energy appearing on the exhibit -- that would be Exhibit 18-B -- you have a figure of 1729, and when you subtract the total of Colstrip 3 and 4, 129 and 98, we come up with 1502?

A Right.

Q As far as peak is concerned, what is the story on that?

A Do you want me to go through the same mathematics?

Q Yes, please.

A Sure, if you want me to.

Q You're subtracting, aren't you, on 18-B, from the figure of 3502, the peak total resources, the resources attributable to 3 and 4, 175 and 175, as to each, and you come up with the figure 3502, and Exhibit D indicates --

A Indicates that figure corresponding to the exhibit that you just showed me.

HEARINGS EXAMINER: Are you going to take considerably more time with this witness?

MR. BELLINGHAM: No, sir, I will not. I'm nearing the end. There are some other things, however.

HEARINGS EXAMINER: Let me hear what your respective views are as to whether you want to finish him before lunch or after lunch. You've got some redirect, I suppose?

MR. SHENKER: Yes, I'd like to know if we could get Mr. Cogan on and off this afternoon. Mr. Bellingham indicated it would be about an hour for cross-examination of Mr. Cogan. In order to get him on and off, I would, I suppose, defer redirect examination until after we can finish Mr. Cogan.

HEARINGS EXAMINER: I wonder if it would be too disruptive, when we come back at 1:00, if we put Mr. Cogan on, and you complete your cross of this gentleman when Mr. Cogan is through?

MR. BELLINGHAM: That's satisfactory with us.

HEARINGS EXAMINER: Would that be helpful or not?

MR. SHENKER: Sure, if you can finish Mr. Cogan in that time frame of an hour or so, Bill?

MR. BELLINGHAM: I would think so, yes.

MR. SHENKER: Okay, let's do it that way, Carl.

HEARINGS EXAMINER: Is that agreeable with everyone?

(IT IS AGREED TO.)

HEARINGS EXAMINER: All right, let's recess until 1:00 o'clock. When does his plane leave?

MR. SHENKER: At 3:15.

HEARINGS EXAMINER: Then you'd have an hour and a half or so. All right, we'll recess until 1:00 o'clock.

(HEARING RECESSED AT 12:07 P.M.)

Following the luncheon recess, the hearing reconvened at 1:05 P.M. on February 17, 1976.

APPEARANCES (In addition to those listed in the morning session):

Department of Natural Resources and Conservation:

William G. Sheridan, Esq.

Northern Plains Resource Council

Leo Graybill, Jr., Esq.

ARNOLD COGAN, called as a witness by the Department of Natural Resources and Conservation, having been first duly sworn upon his oath, both as to his written direct testimony and as to the oral testimony to follow, was examined and testified as follows:

MR. SHENKER: May we proceed, Mr. Davis?

HEARINGS EXAMINER: Yes, sir.

MR. SHENKER: We would like to offer now the testimony of Arnold Cogan, and there are two typographical errors which should have been noted in that statement. On page 17, line 15, the reference to Exhibit 1 should be a reference to Exhibit 100. On page 35, line 1, the word "if" should be the word "is." And in connection with, and offered through, the testimony of this witness, the Department of Natural Resources and Conservation offers Exhibit number 100, which illustrates the testimony that is set forth in the prepared written direct examination.

HEARINGS EXAMINER: Arden, would you say that first correction again?

MR. SHENKER: Yes. Page 17, line 15, Exhibit 1 should be Exhibit 100.

HEARINGS EXAMINER: Okay. You may cross-examine, Mr. Bellingham.

(THE WRITTEN DIRECT TESTIMONY OF MR. ARNOLD COGAN WAS DIRECTED TO BE INSERTED AT THIS POINT.)

PRESENTATION OF TESTIMONY ON BEHALF OF
THE STATE OF MONTANA
DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
RELATIVE TO THE PROPOSED DEVELOPMENT OF COLSTRIP UNITS 3 AND 4

BY ARNOLD COGAN, ADVISER TO COUNSEL

I. INTRODUCTION

A. Biography and experience of Adviser to Counsel

Presently, I have my own consulting practice in Portland, Oregon where I specialize in the fields of planning and public affairs for a wide variety of governmental and business clients in the western United States. The principle services offered are in the following fields:

- Developing policies and strategies for land use and growth management programs;

- Assisting public agencies and private organizations to achieve mutual goals and satisfy common interests;

- Devising methods for improving productivity and reducing conflict through training and community information programs;

- Organizing administrative, operational and institutional units for creative action.

During the past year, I have been or am currently responsible for the following consulting assignments:

- Evaluating institutional and management approaches for increasing the efficiency and effectiveness of local efforts to improve water supply and quality for the Washoe Council of Governments, Reno, Nevada; and the Denver, Colorado Regional Council of Governments;

- Assisting local elected officials in The Municipality of Metropolitan Seattle, Washington; and the Columbia Region Association of Governments, Portland, Oregon; to create an improved process of decision making on environmental issues which would produce constructive input from community leaders and citizens;

- Designing the management, statutory, regulatory and operational instruments for improving the ability of the State Department of Local Affairs in Colorado to deal with land use and growth issues;

- Preparing a program for the Pacific Northwest River Basins Commission to coordinate and integrate Columbia River developments by ten federal agencies and five northwest states;

- Analyzing for Governer Cecil Andrus of Idaho the orpions avialable for adjusting the Statewide Air Quality Classification system to permit greater or lesser growth where needed;

- Assisting Governor Dan Evans of Washington with the development of a policy to resolve a conflict between the state and twenty two Indian Tribal Councils on the issue of taxing commercial enterprise on the reservation.

From February 1974 to February 1975 I was the first director of the Oregon State Department of Land Conservation and Development. My initial task was to organize the new agency and establish basic administrative procedures. Under my direction, more than 10,000 Oregonians were involved directly in workshops all over the state where they helped determine basic land use policies. In addition, over 200 technical specialists helped augment the fulltime professional staff in preparing a comprehensive set of statewide goals and guidelines. The final document covered 14 elements including agriculture, economic development, housing, hazardous areas, transportation, urbanization, forestry and citizen participation. I also initiated a process for coordinating the actions of federal, state and local agencies undertaking important capital improvement projects.

From 1969 to 1974 I was employed by Daniel, Mann, Johnson & Mendenhall, an international consulting firm of engineers, architects, planners and economists. First as Chief Planner and then as Associate Vice President for Planning and Economics, I was responsible for the organization, management and expansion of these services to public and private clients throughout the United States. Studies included development of a guide for statewide land use planning in Alaska; citizen participation programs for a Seattle transit study; annexation and consolidation of service districts in the Willamette Valley, Oregon; 40-mile Rio Salado Riverfront Redevelopment Project in Phoenix, Arizona; recreational development in Vail, Colorado; and community redevelopment for the Colorado River Indian reservation. In addition, I directed the compilation of numerous environmental impact studies and permit applications for public and private developments. I planned and directed the Western States Conference on Growth on behalf of the Governor of Oregon and the U.S. Department of Housing and Urban Development. At that conference approximately 120 delegates selected by the governors from the eight western states came to a consensus about land use, social, economic and political issues.

From 1967 to 1969 I served in the Office of Governor Tom McCall of Oregon as Oregon's first State Planning Coordinator. I was responsible for organizing and directing a statewide planning program and designed and implemented a system of state administrative districts for use by all state agencies and local units of government participating in multi-county programming. As a member of the Governor's staff, I provided advice and recommendations on such issues as land use, zoning controls, housing, economic development, model cities, campus and prison unrest.

From 1962 to 1967 I was employed by the Port of Portland Commission as its first planning director. I was responsible for developing plans for the Port's capital improvements for industrial development, aviation and marine departments. I advised management and coordinated Port programs with other private and public agencies and prepared the Port's comprehensive plans and studies. I directed the preparation of a comprehensive plan for the Port's Rivergate District including 12 square miles of undeveloped land at the confluence of the Willamette and Columbia Rivers. I also was responsible for the planning of the 600-acre in-town Swan Island Industrial Park.

From 1954 to 1962 I worked for Portland consulting firms and the Portland City Planning Commission. While with the city I was responsible for the work of a team preparing long-range plans for the downtown district and major city trafficway facilities. Also during this period I was stationed with the U.S. Army in Detroit, Michigan where I served as a planning engineer for the Ordinance Division.

My academic background consists of a B.S. degree with honors in Civil Engineering from Oregon State University followed up by graduate work in planning and political science at Portland State University. I received specialized training in construction planning from the U.S. Army Engineers School in Fort Belvoir, Virginia. I am currently a registered Civil Engineer in the State of Oregon and am a member of the American Institute of Planners.

For four years I was a member of the Oregon Environmental Quality Commission serving one year as its vice chairman. I have written and published numerous articles and my statements have appeared in national magazines including Saturday Review/World, Architectural Forum, Public Works and Planning. I also have been the principal speaker before many national organizations such as the American Association for the Advancement of Science, American Society of Civil Engineers and the American Institute of Planners. I have been interviewed numerous times on radio and television programs on the subjects of land use, environmental quality, citizen participation and public administration.

B. Purpose and scope of study

The basic purpose of my work is to serve as an adviser to counsel in connection with the evaluation of Colstrip Units 3 and 4 and the associated transmission lines and attendant facilities. Counsel is the Portland, Oregon law firm of Tooze, Kerr, Peterson, Marshall & Shenker with retained counsel in Montana who represent the Montana State Department of Natural Resources and Conservation. The scope of my work and this presentation of testimony covers my analysis and evaluation of the following principle elements:

- growth management;
- land use;
- governmental and institutional capacity.

C. Field trips and interviews

Two field trips were made to the state of Montana for the purpose of making first-hand observations, conducting interviews and accumulating data and information relevant to my study. The first trip was made on March 23 through 25, 1975 and was spent in Helena, primarily interviewing state officials. The second was on April 24 and 25 of that year to Billings, Forsyth and Colstrip to observe the Colstrip site and interview personnel conversant with development there. A list of all persons contacted and dates of meetings follows:

Steve Brown, Legal Counsel, Office of the Governor, March 25, 1975

Carlos Cavanagh, Vice President, Stone & Webster, Consultants, Denver, Colorado, telephone interview March 20, 1975 (formerly with Ken R. White and supervisor of John Stanford)

Bill Christiansen, Lieutenant Governor, March 24, 1975

Dorothy Eck, State-Local Coordinator, Office of the Governor, March 25, 1975

Don Patterson, Services Research Coordinator, Montana State Commission on Local Government, March 24, 1975

Hal Price, Administrator, Division of Planning, State Department of Intergovernmental Relations, March 25, 1975

Eldon Rice, Rosebud County Planning Director, April 25, 1975

John Stanford, Director, Planning Office, City of Aspen, telephone interview April 8, 1975 (former project manager for Ken R. White on Colstrip planning study)

Jeannette Studer, Old West Regional Commission, April 25, 1975

Gary Wicks, Director, Department of Natural Resources and Conservation, March 24, 1975

Energy Planning Division, Department of Natural Resources and Conservation -

- Dr. Albert Tsao, Administrator, March 14, 1975
- James Falvey, Chief, Cultural Sciences Bureau, March 24, 1975
- Robert Cleary, Landscape Architect, Cultural Sciences Bureau, March 24, 1975
- John Fitzpatrick, Sociologist, Cultural Sciences Bureau, March 24, 1975

II. - GROWTH MANAGEMENT

A. Identification of issues

Based upon my field research, personal evaluation and professional judgement, I have concluded that the process of growth which will be triggered by the development of Colstrip Units 3 and 4, and the state's ability to cope with the problems induced by this growth revolve around the following issues:

1. How can the benefits of satisfying anticipated energy shortages in the northwest be balanced equitably against the growth problems imposed upon a localized part of that northwest area, namely Rosebud County in eastern Montana.
2. What planning processes need to occur which will allow state and local agencies to consider and deal with the problems of growth from a preventative position rather than a remedial one.
3. What institutional and regulatory processes need to be created in Rosebud County to provide an adequate capability to deal effectively with the burdens imposed by rapid growth.
4. How can present and future residents in Colstrip, the surrounding area and Rosebud County express themselves effectively and participate in the crucial decisions which need to be made on these growth issues.
5. How can our national interests and the free enterprise system be protected without sacrificing the cultural patterns, social lifestyles, traditional values and

environmental quality, all which are considered important to the livability of eastern Montana.

B. State of the art for addressing growth issues

This section will examine comparable experiences of states in the west which are addressing growth issues, and the process in the state of Montana. Additional commentary is included about multi-state coordination.

1. Comparable experiences in western states

Many western states are beginning to take dramatic steps to address their problems of growth. Some of these are in response to a concern for halting environmental degradation; others to specific pressures for the extraction of energy resources and minerals; still others are a reaction to rapid urbanization of a portion of the state. Most states are attempting to bring about an orderly process of balanced growth and wise use of scarce resources. The new vigor and willingness which many western states have demonstrated in their attempts to address vital growth issues is a dramatic new phase in the development of the west. Especially in this decade, western states have seized the initiative in developing innovative approaches to land use planning and growth management processes.

It must be recognized, however, that the state of the art for developing and implementing growth strategies and policies is still in its infancy. Some western states have initiated imaginative efforts to develop growth policy models, guidelines and standards, and in some cases, regulatory processes to deal effectively with growth at the state and sub-state level. An April, 1975 publication by the Council of State Governments, Land-State Alternatives for Planning and Management, states that, "Knowledge of the amount of growth or change which may occur within various time frames is important to a planning process which attempts to manage resources instead of simply allocating resources to meet virtually unconstrained needs."

The development and implementation of growth policies can provide a sound foundation on which to build a statewide program of balanced conservation and development. At present many state policies and programs, in Montana and elsewhere, are carried out by dozens of federal, state and local agencies, each pulling and tugging in separate and sometimes conflicting directions. Such fragmented and disjointed processes erode the state's resources and effectiveness in dealing with the critical issues of growth.

It is essential for western states in general, and Montana in particular, to take steps which will improve the capability for more effective development and coordination of growth strategies among local, state and federal levels of government. Both the private sector as well as the public have much to gain from a more clearly understood and efficiently organized process of growth planning.

2. The growth management process in Montana

Management of growth by Montana state agencies seems to be predicated upon the attitude that the status quo should be preserved and any pressures influencing change should be dealt with primarily at the local level. The state's Utility Siting Act of 1973 does place the State Department of Natural Resources and Conservation in a position to review and evaluate projects such as Colstrip Units 3 and 4. However, other than the one-time consideration of some of the growth implications inherent in a specific project there seems to have been little on-going attention given by the state to more general growth problems confronting local government and the ability of local government to meet these problems. As a result, neither Rosebud County nor the state has prepared itself to deal adequately with the impacts of growth produced by Colstrips 3 and 4. No limits to growth have been articulated nor have there been any standards to quantify these limits. There is no single state agency with a growth management policy or process which can be expected to function satisfactorily at the state or sub-state level.

3. Multi-state or regional planning

The potential does exist to undertake some planning of growth strategy at the multi-state level. Serious investigation of available regional planning capabilities should be made. At the present time there are at least three multi-state regional bodies which include Montana in its membership. These organizations are:

Federation of Rocky Mountain States, Denver, Colorado This organization was established in 1966 as a partnership among the states of Colorado, Idaho, Montana, New Mexico, Wyoming and Utah. They work together to identify common regional issues and develop regional policies and programs to solve these problems.

The board of directors includes the governors of the six Rocky Mountain states plus business people, educators, legislators and planners. The organization is financed through state appropriations and membership dues. There are approximately 300 business and industrial members. In addition, specific projects are financed by grants from federal agencies. Federation activities are carried on primarily through its eight councils on regional coordination, natural resources, market development, transportation, human resources, tele-communications, housing and community development, and arts and humanities.

Old West Regional Commission, Rapid City, South Dakota

Montana, Nebraska, North Dakota, South Dakota and Wyoming are members of this organization which was established in 1972 under the Public Works and Economic Development Act of 1965 to stimulate orderly economic growth in the five-state area. The commission is funded by congressional appropriations which are allocated to research, development and demonstration projects. Federal funds for operating expenses of the commission are matched by the states.

The commission, composed of both federal and state members, is directed by co-chairmen: a federal representative appointed by the President with the approval of the Senate; and a state representative chosen from among the state governor members.

Its purposes are to pursue programs which enhance the economic climate of the region including the following:

- increasing agricultural production, expanding processing and marketing facilities and attempting to resolve water rights problems;

- helping to improve educational opportunities, especially in the vocational area, and by upgrading health care and housing;

- providing regional economic data to financial institutions, assisting in product development, attracting new industries to the area and expanding local public investments;

- seeking better facilities and service among all forms of transportation;

- developing guidance for state and local officials, helping them to make resource policy decisions protecting the long-range interests of the region and its people.

Western Governors Regional Energy Policy, Office, Ltd.

Denver, Colorado

This organization is a corporation formed among the governors of Arizona, Colorado, Montana, Nebraska, Nevada, New Mexico, North Dakota, South Dakota, Utah and Wyoming. Policy is determined by a board of directors composed of the governors of each of these states who are members of the board as long as they are in office. Funding is shared by the Old West and Four Corners regional commissions. Former North Dakota Governor William Guy is the executive director. The organization was formed in 1975 to carry out the following purposes:

- foster interaction and cooperation among the particpating state governments in regard to energy-related issues;

- foster enunciation, within and without the region, of common problems and policies;

- encourage participating states to develop unified policies and programs to deal with western energy development.

C. Evaluation of growth impacts of Colstrip operation

I have considered three possible scenarios of growth and the impact produced by each. While each represents an integrated set of conditions of growth, they are not intended to depict a detailed or precise examination of each growth issue or its impact. Scenarios provide an overview or snapshot describing a variety of implications which may be anticipated if a set of future conditions were to occur. The scenarios explored here are:

- no further Colstrip development
- controlled Colstrip development
- unrestrained Colstrip development

Each of these growth scenarios will generate a number of impacts or consequences. Those which will be discussed here are as follows:

- capacity of local government to serve
- effect on land use
- livability and quality of life
- economic well-being of residents
- likelihood of local and state agencies attaining desired growth condition
- ability of government to cope with impacts

A matrix summarizing the consequences induced by each growth scenario is included as an attachment to this testimony as Exhibit 1. In the matrix, I have used a scoring system to summarize my judgements of the relative strength of each impact. A score of zero is indicative of no impact or an impact which is not applicable to the scenarios; a score between +1 to +5 indicates a positive impact with +5 representating the best; a score between -1 to -5 indicates a negative impact with -5 representing the worst.

1. Capacity of local government to serve

No further Colstrip development would produce little or no impact on the capacity of local government to serve. Local government, primarily at the Rosebud County level, is barely able to accommodate normal growth in the area, even without Colstrip. That status quo condition would not be disturbed if Colstrip Units 3 and 4 were not developed. However, unrestrained Colstrip development would place a large burden on local government to provide the needed levels of service required by rapidly expanding population. At the present time there are no public limits other than the economic restraints that a private company might place upon itself, to growth in Rosebud County. Rosebud County government and other local units have exercised neither the legal nor the regulatory instruments to keep growth in step with available facilities and services.

Controlled development phased out over a reasonable period of time still would place burdens upon the capacity of local government in Rosebud County to serve. However, greater opportunity would be available to organize the regulatory, institutional and operational processes needed. Such a modulated or managed approach to growth and development in the county also would provide the time to investigate the availability of needed financial resources at either the state level or those private industries most interested in Colstrip development. The subject of governmental capacity is studied more thoroughly in section IV.

2. Effect on land use

If unrestrained Colstrip developments were permitted, there would be a substantial adverse impact on the land use, not only in the Colstrip and immediate vicinity, but throughout the other urbanized and urbanizing portions of Rosebud County. Such impact could be mitigated if there were a comprehensive plan for the county for those areas most affected by Colstrip development. However, there is no plan nor is it known when a comprehensive land use plan will be prepared. Even the condition of controlled development will have a negative impact without the benefit of any comprehensive planning. The only condition in which there is a benefit in the absence of such a plan is no further Colstrip development. All conditions could produce a different range of impacts if a well formulated comprehensive plan were adopted which takes into account the type of growth which Colstrip Units 3 and 4 would induce. Further discussion on land use is contained in section III.

3. Livability and quality of life

Because of the lack of any preparation at either the state or local governmental levels for the type of growth which Colstrip 3 and 4 will stimulate, the only condition under which the quality of life in Rosebud County could be maintained is one of no further Colstrip development. The worst impacts would come from unrestrained development; and they would be only slightly better under the controlled development condition. Like the land use situation, this set of impacts could be improved if governmental agencies were to take more aggressive and vigorous steps to prepare for the inevitable growth. The quality of livability doesn't necessarily have to suffer just because of growth. However, inattention by government to the impacts and over-reliance on the private sector to mitigate the problems will not resolve this particular issue satisfactorily.

4. Economic well-being of residents

In a typical boom town situation there are winners and losers. Generally, the winners are those who either own businesses which will profit from the increased trade or land which is needed for immediate development or is favorably located for future use. The losers are those who are poor or living on fixed incomes facing rapidly increasing costs of essential items. These unfortunate people usually do not share in the job opportunities or the potential for higher economic status. Long-term residents may become losers when they discover they must pay for many of the public costs incurred by the influx of temporary residents such as construction workers. For the 'winners', obviously, no further development of Colstrip would be an adverse impact while it would be favorable to the people who might be called 'losers'. On the other hand, unrestrained development of Colstrip would be a most favorable situation for the 'winners', while it could be nearly disastrous for the 'losers'. Some controlled development of Colstrip would still favor the 'winners' and have an adverse impact upon the 'losers'. However, programs of government or private industry undertaken with sensitivity to this problem could mitigate some of the hardships.

5. Likelihood of state and local agencies attaining desired growth condition

There has been so little advance planning that even without any further Colstrip development it will be difficult for state and local agencies to attain desired growth conditions. To attain any goal, no growth, controlled or even unrestrained growth requires deliberate action on the part of governmental agencies to plan and implement appropriate economic development, environmental, agricultural and human resource programs.

If there is little likelihood of local and state agencies attaining desirable growth conditions under the condition of no further Colstrip development, then it will be virtually impossible under a program of unrestrained development. This condition assumes that an aggressive industry will have every opportunity it wishes to take the lead in determining what the future of Colstrip will be and that state and local agencies will maintain a more or less laissez faire position in this regard. It is implicit to this particular condition that while industry would attain its desired growth objectives, most of the people in Rosebud County would have little opportunity to enjoy the benefits of that growth, much less participate in creating it.

Controlling Colstrip development presents the best opportunity for state and local agencies to attain desired growth conditions. Agencies would be able, over a period of time, to establish objectives and standards which define desirable growth limits. They also would have the best opportunity to create the planning, institutional, financial, regulatory and operational processes to assure attainment of that growth level.

6. Ability of government to cope with impacts

If there is no further Colstrip development, it is assumed that there will neither be any beneficial nor adverse impacts. Governmental agencies would be able to cope with that situation about as well as they are doing now. However, under the condition of unrestrained development, there is little reason to believe that governmental agencies, particularly at the local level, will have the necessary personnel, sufficient funds, required legal instruments and political support to deal with the magnitude of impact.

under controlled Colstrip development, the state may be able to marshal the required technical and financial aid and regulatory muscle to help local agencies become more capable in confronting the impact. Local agencies faced with a mandate from the state to perform certain acts, would be less vulnerable to local pressures and more likely to undertake necessary planning, regulatory and operational steps. The ultimate success of this approach will depend to a large extent upon the capabilities of state and local agencies and the willingness of private industry to cooperate.

III. LAND USE

A. Land use management operations

1. Planning and regulation

Most western states, including Montana, operate under the philosophy that the primary responsibility for land use planning, and in many cases land use regulation, should be at the local level. In some, local government is required to adopt plans and implement regulations in accordance with statewide land use goals and guidelines.

Recent federal and state court judgements have elevated the status of the local comprehensive plan to a basic policy document. A 1975 Oregon Supreme Court decision (Baker vs. City of Milwaukie), with implications far beyond that state, determined that zoning must be consistent with a comprehensive plan and that it is invalid where it is not in accord. Other court decisions also are identifying the local and regional comprehensive plan as the key policy document to be produced by the local legislative process to guide community growth and development.

While these decisions enchance the significance of the local role in land use and growth decision making, they also indicate the danger that by moving into the courts or state bureaucracy these functions actually could be moving away from the city and county level.

This flotation process may be effective in the short run in bypassing local bottlenecks and resistance to change, but it inevitably breeds a more abstract planning process open to the accusation that it is dictatorial and an unreasonable intereference upon local initiative. Planning at higher levels is not necessarily better planning.

2. Coordination

Land use planning and functional planning activities in such areas as transportation and natural resources need to be coordinated. Any such coordination, however, requires an awareness of and sensitivity to local governmental needs. If it is the intent of Montana officials to continue a strong reliance upon local government and even strengthen its role in the decision making process, it is then very important that land use planning and regulatory activities be placed in the state level agency having the greatest responsibility for local coordination, interface and service.

The state land use planning process must integrate with and provide a framework for a wide range of functional planning and regulatory activities. Areas which must be coordinated with land use planning are transportation, housing, agriculture, recreation, utility systems, undeveloped areas, natural resources and economic development programs.

3. Principles of organization

A unified approach to state land use policy and related natural resource and environmental programming is essential. This does not necessarily require that all activity be located in a single organization, but it is important that basic policy direction be centralized.

The relationships among planning, operating and regulatory functions must be considered carefully. Though coordination is desirable, strong arguments can be made for separating these elements. Planning components should concentrate on policy, unburdened by day-to-day operating problems; operating components should be specialized and regulating components should be free from prior biases in order to enforce necessary regulations fairly.

Land use planning activity must be a part of the executive and legislative functions; isolation from the political process will decrease its effectiveness. While state agencies most likely should establish guidelines, locate critical areas and coordinate significant activities, the local agency must be empowered to determine its own priorities. A process of plan review and approval must be developed which builds in environmental safeguards but doesn't penalize the reputable land owner, realtor and developer. Some specific suggestions for state land use management organization are as follows:

- The land use planning agency should have direct staff access to the office of the governor, and as such, is the logical lead agency in this regard.

- Where land use planning is undertaken by an agency with broad policy planning and management assistance responsibilities, functions such as A-95 and EIS review should be combined with land use planning.

- A variety of techniques should be used to insure public participation at each stage of the land use planning process.

- The relationship between the land use planning agency and the legislature is of major importance and must be assigned high priority.

B. Status of land use programs

1. The nation

Following is a summary of efforts throughout the country to organize, manage and finance state land use programs. Although each state, naturally, has tried to meet its unique needs in a particular way, their efforts can be summed up into certain general categories.

In most states, the lead land use planning agency is the state planning office which may be in one of several places in the governmental structure. Arizona (temporarily) and Colorado have divided the lead function between two agencies. In Oregon, the program is managed by the Land Conservation and Development Commission, an independent group of citizens appointed by the governor which selects its own director. Any areas determined to be of critical state concern must be so designated by the Oregon legislature.

Designation of the state planning office as the lead agency helps to centralize the land use planning function. Regulatory activities affecting land use are, however, often scattered throughout the governmental structure and in some cases rest with an independent agency (e.g., Maine's Board of Environmental Protection). The lead agency usually provides coordination among functional program departments and local governments, also coordinating the A-95 process and participating in EIS reviews. It frequently staffs the interagency committee responsible for policy or recommendations.

Local and regional roles in state land use programs vary from state to state. Both Florida and Vermont place extensive regulatory powers in the hands of local government and regional agencies. In Florida, local governments are required to adopt regulations for critical areas recommended by the Division of State Planning. Regional agencies review proposed developments of regional impacts and submit the report to local governments. In Vermont the District Environmental Commissions administer a permit program in accordance with a state plan, subject to state review and approval.

Oregon places primary responsibility for land use planning at the local level. All counties and the City of Portland as well are required to adopt plans and implement regulations in accordance with state goals and guidelines. Maine has a similar system but also maintains direct state control over "unorganized territory" which is about one half of the state.

In an April, 1975 report by the Council of State Governments, Land-State Alernatives for Planning and Management, the following summary was presented:

"More than 21 states are attempting to set goals for future development. Fifteen have joined together to organize the Southern Growth Policies Board to identify growth alternatives for that region. Six states have formed population commissions and ten state legislatures have adopted population stabilization resolutions. Twenty one states are undertaking statewide land use planning programs, and eight have reached the regulatory stage. All states have some elements of land use control legislation directed to specific areas or problems such as coastal zone management, wetlands management, powerplant siting, surface mining, critical areas designation, property tax incentives, or flood plain management."

2. The State of Montana

At the present time the State of Montana does not have a comprehensive statewide land use planning law. The state does have legislation authorizing the formation of city and county planning boards. Once a city or county planning board is formed it must prepare a master plan and serve in an advisory capacity to local governmental bodies. In addition, such boards may act as zoning commissions to create the initial zoning ordinance and map and recommend subdivision regulations.

In Montana there has been a traditional reliance on strong local government. Despite the fact that in recent years the legislature has acted to reorganize state government into a more effective departmental structure, many resources, powers and responsibilities still are delegated to cities and counties.

Unfortunately, there has been a lack of state direction or criteria to guide the counties and other local planning units in the most effective use of these resources. The inevitable result has been confusion among local governments and a loss of momentum and policy direction for the state. A unified approach to state land use policy and related natural resources and environmental programs is essential, particularly from the standpoint of policy/activity coordination.

3. Community of Colstrip, nearby areas and Rosebud County

The plan for Colstrip prepared by the Ken R. White Company dated December, 1972 is intended to guide the growth and development expected to be produced by Colstrip Units 1 and 2. On October 1, 1973 the Rosebud County Board of Commissioners, in adopting a set of interim zoning regulations for the Colstrip area, also adopted the Ken R. White plan as its plan for the unincorporated community of Colstrip. No plan for anticipated growth and development resulting from construction and operation of Colstrip Units 3 and 4 has yet been submitted to the County Planning Commission or County Board of Commissioners for review.

I have reviewed the Ken R. White plan for the unincorporated community of Colstrip and have reached the following judgements: It is inadequate because -

- The plan is a layout for a company town with obvious domination by the coalstripping/power plant operation. Urban developments, including uses for residents, commerce and recreation, are nearly surrounded by the industry, with little or no opportunity for diversification or expansion of industry.

- The area set aside as available for residential, commercial and recreational developments is limited; and there does not appear to be enough additional space set aside for adequate community facilities.

- The plan is what I would consider dull and unimaginative, very much oriented to the dominant industry and not to the residents themselves. It is not the type of plan which would foster a high level of livability and quality of life.

No planning seems to have occurred thus far which would anticipate the effects of development of Colstrip Units 3 and 4. The only apparent recognition of plant expansion is a large area of undeveloped land shown on the plan.

- Neither the Ken R. White plan nor the County Planning Commission appears to have any provisions at this time for the preparation of a comprehensive plan for that area surrounding the unincorporated community of Colstrip.

In adopting the Ken R. White plan for Colstrip, the County Board of Commissioners incorporated interim regulations with the following features:

- Permitted existing non-conforming uses, such as buildings and structures already in use at the time of the adoption of the regulations.

- Limited all other areas in the sections identified in the regulations as restricted to their existing use or for "agriculture, residental, non-profit recreational, ranching, forestry, conservation, public utility, airport, religious, educational or conservation purposes".

- Placed nothing in the regulation to be construed to "prevent the use, development, processing or recovery of any mineral, forest or agricultural resources by the owner".

- Placed nothing in the regulation "to prevent or affect the construction, maintenance, repair or removal of public utility and transportation facilities in the area affected".

In addition to the interim zoning regulation approved by the County Board of Commissioners, subdivision regulations for the county have been prepared and the subdivision plats for Colstrip development from Units 1 and 2 have been approved by the County Board of Commissioners in January, 1975.

C. Evaluation of land use situation

Following is a summary of my evaluation of the land use situation created by the developments which have already occurred in Colstrip and the probable impact on land use which will be produced by the proposed Colstrip Units 3 and 4.

1. At the present time, Rosebud County is without a comprehensive plan. Under grants from the Old West Regional Commission and the U.S. Department of Housing and Urban Development, the Rosebud County Planning Commission is beginning to undertake some

land use planning. However, the work if only now at the initial stages of data collection and mapping. Hopefully revenues from coal taxes will be made available to accelerate or assist in the planning processes.

Because at the present time there is inadequate staff capability in the Rosebud County Planning Commission to undertake the needed planning work, additional people must be recruited and trained in order to make any substantive progress. The director of the Planning Commission for the last two years, a former extension service agent, is familiar with the Rosebud County area although he is not a trained planner. The only other professional help available is a field office of the state Division of Planning in Glendive which provides, on an intermittent basis, some advice and assistance.

2. The Rosebud County Planning Board is composed of nine people who are for the most part businessmen and landowners. Attitudes toward land use planning of board members are diverse, ranging from those who resent state interference with land use matters to others who resist any type of forward movement of the county into land use planning and still others who have a desire to influence the direction in which the county will grow and how land is to be used. At this time, there does not

appear to be any single strong direction. It is my judgement that the major reasons behind the tentative preparations to begin a comprehensive planning program are the mandates of state law and requirements of implementing agencies.

3. The development of Colstrip and the related land use planning has been stimulated more by the desire to excavate coal and produce power than by a deliberate decision to locate a city in a desirable location compatible with other land uses around it. In other words, the site was chosen first for its coal deposits and all land use planning thereafter was undertaken to try to minimize adverse impacts.

4. There has been little accomplished in the way of state, regional or local land use planning to help the community of Colstrip, the immediately surrounding area or Rosebud County prepare for or mitigate adverse land use impacts. Because the state has not mandated land use planning, local government has been left in a position which is vulnerable to outside pressures to use land for whatever seems best for the landowner, the business community or other special interest. Any public benefits of land use planning have been interpreted in terms of the benefits gained by these individual

groups. As long as that practice continues, the quality of planning and the suitability of the resulting land use patterns will be oriented more toward economic priorities than to the full spectrum of public needs which must be addressed in a balanced comprehensive plan.

IV. GOVERNMENTAL AND INSTITUTIONAL CAPACITY

In the previous sections of this testimony the subject of governmental and institutional capacity has been discussed insofar as it relates to the issues of growth management and land use. A substantial number of reports, research papers and other written materials have been prepared on the capacity of governmental agencies and public institutions to maintain adequate levels of service in the face of new pressures and demands induced by development of Colstrip Units 3 and 4. Therefore, there is no point in reiterating that which has already been stated earlier or reported elsewhere. This section of my testimony is devoted to an identification and clarification of the pressures induced by Colstrip development and an evaluation of the ability of state and local governments to develop an adequate responsive capacity.

A. Identification of pressures induced by Colstrip development

It can be anticipated that extensive and accelerated growth which will be produced by development of Colstrip 3 and 4 will have a significant impact on the ability of governmental agencies and public institutions at the local, state and even the federal level to provide the public facilities and services needed. Some of these pressures can be summarized as follows:

1. Because of its relatively low tax base, Rosebud County, the unit of government upon which the greatest impact will fall, will be hard pressed to find the necessary finances to pay for the services and facilities in time to satisfy need. The tax base which will be created by full development of Colstrip generating units will produce substantial revenues, but far too late to help with the initial social and economic problems caused by construction. At the present, aside from schools, there is no mechanism to supply Rosebud County with the necessary funds either from state or from private sources to properly prepare for the need before it becomes a crisis. For schools, the mechanism is untested.

2. Because of its traditional orientation to a rural, somewhat uncomplicated lifestyle, Rosebud County is neigher structurally, institutionally nor operationally equipped to respond within the time available to the demands it is facing. Aggravating this problem is the almost total lack of any planning capability to properly collect data, evaluate problems and recommend effective programs in all of the sectors where action

is needed. There is considerable room for doubt that the [illegible] elected officials and appointed [illegible], who have never before faced such rapid growth problems, can react quickly enough to these planning and decision making pressures before the problem becomes overwhelming.

3. At a time when local government is severely handicapped in its capacity to respond to the pressures induced by rapid growth, there is insufficient capacity in eastern Montana at the field office levels to provide the necessary technical assistance. In addition, there is inadequate state legislation to mandate needed actions by local officials. There are insufficient state resources required to support local services.

4. Aggravating this issue is the question of precedent surrounding the proposal to develop Colstrip Units 3 and 4. This could be a "floodgate" issue opening the way for other in-state electrical generating systems to be permitted to produce electrical energy for export. The problem, then, will not be whether or not Rosebud County will be capable of developing the appropriate governmental and institutional capacity, but whether any impacted local or state agencies will be able to keep from becoming overwhelmed.

Evaluation of governmental capacity

Presently, Rosebud County and other units of local government in the area are having difficulty developing the necessary financial, institutional and operational capacity to provide needed services. Thus, even if no further development of Colstrip generating units is permitted, the county will face great problems developing the proper services and facilities necessary today. An excellent example of a local problem is the deteriorated condition of State Highway 315 from Forsyth to Colstrip. Neither the state nor the county was willing to accept responsibility for the reconstruction of this road until the present time, five years after the beginning of the development of the first two Colstrip units. Other problems stand in the way of major improvements to water supply systems, sewage disposal collection and treatment systems, school facilities, health care facilities, etc. In addition to the facilities, many service needs such as education, mental health care, crime control, youth programs, etc. also must be addressed.

In my judgement, both the environmental impact statements prepared by the Montana Power Company as well as those prepared by the state have underestimated the burden which governmental agencies will be required to bear if the project is approved. At the same time, they have overestimated the capacity of governmental and institutional units to cope with the problems they will face. Whatever efforts currently are underway to undertake some planning is insufficient to the challenge at hand and the likelihood of adequate assistance coming from the state or from the private industries involved is very low.

The proper solution lies with the State of Montana to recognize that it must play a strong role in assisting local government with the financial, legal, regulatory and organizational instruments it needs to properly deal with this problem.

V. SUMMARY OF FINDINGS AND CONCLUSIONS

A. Growth management

1. Neither the applicant, the Montana Power Company, nor the State of Montana has adequately considered the growth issues from the standpoint of desirable limits of growth, specific objectives to be achieved and standards or guidelines to influence their accomplishment.

2. Consideration of growth implications have been limited to those issues related to the extraction of coal for the production of electrical energy with little attention given by the state to the problems of local government or of the ability of any governmental agency, either state or local, to determine the future character and livability of the region.

3. A controlled or modulated development of Colstrip over a relatively long period of time would produce the most desirable growth position for the impacted retion.

4. No agency, at the state or local level, seems to have initiated the development of growth policies either for the state as a whole or for any region. The development of statewide independent growth policies is desperately needed for Montana, particularly during this period of potentially rapid growth. Without such policies, planning for land use, public facilities and social services in uncoordinated, with no prioritization or expression of choice possible on how critical financial, physical, human and environmental resources are best utilized.

B. Land use

1. To put it briefly, there has been little accomplished in the way of any state, regional or local land use programming.

2. Local government has been left isolated in a position which makes it vulnerable to enormous outside pressures of the landowner, the business community and special interests - but least of all the public.

3. Most western states are moving vigorously ahead with some type of statewide land use program which expresses goals and guidelines for the conduct of local comprehensive planning, identifies areas of statewide critical concern and provides for the coordination of important state and local activities in support of desired land usage.

4. The State of Montana, if it is to keep ahead of the type of pressure now growing in Rosebud County and elsewhere, must develop a comprehensive statewide land use policy together with the necessary legislation to implement it.

C. Governmental and institutional capacity

1. The environmental impact statements prepared by the Montana Power Company and the State of Montana have underestimated the burdens which governmental agencies will be required to bear if the project is approved. They have overestimated the capacity of these agencies to cope with the burdens.

2. Lack of an adequate tax base in Rosebud County to support needed services will continue to be a critical problem. Some financial help from the state and perhaps from the private industries involved is needed.

3. Because of the lack of planning or forethought, even if local government wanted help from the state, there is little or no capability, authority or time now to permit it to be effective if Colstrip Units 3 and 4 are approved for development.

EXHIBIT I

Scenarios of Growth and Related Impacts

lternative cenarios of olstrip evelopment	Capacity of Local Government to Serve	Effect on Land Use	Livability and Quality of Life	Economic Well-Being of Residents		Likelihood of State & Local Agencies Attaining Desired Growth Condition	Ability o Governmen to Cope With Impac
				Winners	Losers		
o further olstrip evelopment	0	+3	+3	-3	+3	-2	0
ontrolled evelopment f Colstrip	+2	-2	-2	+2	-2	+3	+1
nrestrained olstrip evelopment	-3	-5	-5	+5	-5	-4	-5

+5 Highest positive impact
0 No impact or not applicable
-5 Lowest negative impact

EXAMINATION OF ARNOLD COGAN

Cross, by Applicants,

By Mr. Bellingham:

Q You live in Portland, Mr. Cogan, is that right?

A Yes, I do.

Q How long have you lived there?

A Since 1947.

Q Are you familiar with the law firm that Mr. Shenker is a part of?

A Yes, I am.

Q Have you had previous assignments for them?

A No, I have not.

Q This is your first one for them, is that correct?

A Yes, that's right.

Q I assume that you're charging them a consultant fee, a flat rate; is that right?

A An hourly rate.

Q Right. An hourly rate. What is that hourly rate?

A Fifty dollars an hour.

Q And I see that for the past year, you're currently responsible for certain assignments set forth in page 2 and page 3; is that right?

A That's right.

Q All of those assignments involve governmental units of one form or another; is that right?

A Yes.

Q Do you have a B.S. degree in civil engineering?

A That's right.

Q When was that?

A 1954.

Q And graduate work in planning and political science at Portland State. How many years were you involved in that?

A Over a period of about three and a half years.

Q That is in total years?

A Total elapsed years.

Q You actually did attend there on advanced graduate work for three and a half years?

A Yes.

Q Or was it spread out?

A Spread out over a period of three and a half years.

Q How many years did you actually go to school as far as graduate work is concerned?

A All of that graduate work was in the evening while I had a regular job. So, that was evening work confined to the evening hours after regular hours.

Q Did you receive any degree as a result of that?

A No.

Q Now, I think on page 7 you indicate that you made two field trips to the state of Montana. The first was made March 23 to 25, 1975, and spent in Helena primarily interviewing state officials; is that right?

A That's correct.

Q At that time you did not go to the vicinity of Colstrip, I assume?

A That's correct.

Q You did not interview anybody down in the Colstrip area or in the Forsyth area at that time?

A At that time, no.

Q It was limited strictly to Helena.

A That's right.

Q And you've indicated here the people you interrogated or talked to in Helena. That's Steve Brown, is that right?

A I have the names on pages 7 and 8, and those were the people I talked to here during that period.

Q Steve Brown, Bill Christianson, Dorothy Eck, Don Patterson, Hal Price, perhaps Jeannette Studer?

A No -- well, I have the dates after each name, and you'll see further on down, the others that I talked to.

Q Gary Wicks, also, at that time?

A The members of the Energy Planning Division.

Q And then you came back to the state on April 24 and 25, approximately a month later, and you went to Billings, Forsyth and Colstrip?

A Right.

Q What did you do in Billings?

A In Billings, I had some meetings with Mr. Shenker, Dr. Gold, and Mr. Nelson.

Q And who is that?

A Jack Nelson of Commonwealth.

Q You didn't, while you were in Billings, then, interview anybody?

A One interview that I have, that I noted on here that was done in Billings, was with Jeannette Studer of the Old West Regional Commission.

Q How long did that last?

A The interview with Ms. Studer?

Q Yes.

A About two hours.

Q And then from there you went on down, during that two day period, to Forsyth and Colstrip?

A That's correct.

Q Did you stay down there?

A No. We traveled down there in the morning, and returned that evening.

Q On April 24th?

A That was on April 25th.

Q So you spent one day in Colstrip?

A That's right.

Q How many hours were you down there?

A In the city of Colstrip?

Q Yes.

A We were in the city of Colstrip about two hours.

Q And you spent that time looking around?

A Touring the area.

Q Looking the area over?

A Yes.

Q Two hours at Colstrip, and then you moved over to Forsyth?

A We spent the rest of the time in that area, in that general area in Forsyth.

Q And then you came back that evening?

A Then we came back.

Q How long did you spend in Forsyth?

A About two to three hours.

Q And during this period of time, you interviewed people; is that right?

A We interviewed one person in Forsyth and that was Eldon Rice.

Q He is the --

A Rosebud County Planning Director.

Q How long did you interview him?

A About two hours.

Q You didn't interview anybody down at Colstrip?

A No.

Q You didn't talk to anybody down there relative to the town? Any of the people down there, any of the store owners, or anybody else; is that right?

A No, because that wasn't the purpose of my trip. The purpose of the trip was to become acquainted with the area, and to reference myself to some of the physical facilities, and the locations.

Q Well, regardless of the purpose of the trip, you didn't interview anybody at Colstrip?

A That's correct.

Q Didn't talk to anybody down there about the town?

A No.

Q Then when you went over to Forsyth, you talked to one person, is that right? Eldon Rice?

A Right.

Q He was in the county courthouse at the time?

A That's correct.

Q Did you talk to the county commissioners at all?

A No.

Q Do you know the names of the county commissioners?

A I have them in record. I don't remember them at this moment, no.

Q Did you talk to the assessor?

A We talked to just Mr. Rice.

Q You didn't talk to anybody then?

A We talked to Mr. Rice.

Q Other than him?

A No. That was the only purpose of the visit, was to talk to the planning director.

Q Did you talk to any of the tax personnel over at the county?

A No, as I said, he was the only one we talked to.

Q And, back in Colstrip, you didn't talk to any school personnel?

A No.

Q Well, calling your attention to page 9, you say at line 20, you say there, what institutional and regulatory processes need to be created in Rosebud County to provide an adequate capability to deal effectively with the burdens imposed by rapid growth. Now, you consider the growth is to be rapid as far as the Colstrip area is concerned?

A The subject of my investigation concerned a number of issues revolving around the application to construct Colstrip units 3 and 4. The analysis and the evaluation that I made here and that I'm describing, in a preliminary way on this page, present some of the basic issue oriented questions that I thought needed to be answered, with considering the kind of growth that Rosebud County will undergo if Colstrip 3 and 4 are built.

Q Well, do you feel that the growth down in that area of Colstrip, as a result of 3 and 4 being built, is going to be rapid?

A If Colstrip 3 and 4 are built, in the time schedule that I understand, it'll be rapid relative to the kind of growth that has gone on in history, as far as Rosebud County is concerned.

Q What time frame do you perceive that Colstrip 3 and 4 are going to be built in?

A As I understand the construction schedule, it will be primarily developing during the next ten years, as proposed.

Q In the next ten years?

A The basic development and the immediate growth that would be occurring, that I'm describing here, would be occurring during the next ten years.

Q Do you know how long it's going to take to build Colstrip units 3 and 4?

A You mean the actual construction of Colstrip 3 and 4?

Q Yes.

A As I understand, if it were permitted now, or permitted within the next several years, it would be constructed by the mid-'80's.

Q The mid-'80's? By 1985? Is that right?

A Yes.

Q Not sooner than that? You perceive that the units will be stretched out and be completed by the mid-'80's; is that right?

A By the mid-'80's.

Q Would it surprise you to know that the two units are scheduled to come on line, in the present time frame, in 1980 and 1981?

A In the period of growth that I'm analyzing here, it would be primarily occurring within the next ten years.

Q We were talking about construction of units 3 and 4, were we not?

A Are you talking about the construction that would be all complete by 1980?

Q 1980 and '81, yes.

A Well, what I base my impressions on here in my analysis and evaluation and judgments, were based on what I perceived to be the probable time schedule. And, relatively speaking, in connection with this question that we're talking about, the mid-'80's is an appropriate period to conceive of the kind of rapid growth that I'm describing.

Q Have you looked at any annual employment figures tied up to 3 and 4, or, in fact, 1 and 2?

A I've -- Yes, I've seen the employment figures that are contained in the reports.

Q Do you know how many total people were working on units 1 and 2 at the peak of employment?

A I don't recall the number, no.

Q You don't know the number?

A I did know the number when I was evaluating --

Q Is it a thousand?

A The actual construction crew of 1 and 2?

Q Yes.

A As I recall, it would be something on that order.

Q About a thousand? Would it surprise you to know that it's closer to 1500 at the peak of employment?

A As I said, I didn't recollect the exact numbers.

Q What about units 3 and 4? Do you know what the projections are on that, as far as employment is concerned?

A I know it'll be more than what it was on 1 and 2.

Q Do you have an idea how much more?

A I have the impression that it'll be something in the order of 2,000.

Q I think the projections call for a total of 1505 at the peak of the employment period, some 500 less than you mentioned. That wouldn't surprise you?

A No.

Q Do you know when the peak employment will be during the construction of units 3 and 4? What year?

A With the assumption that the construction will be completed by 1980?

Q '81?

A '81. I would suspect that the peak employment would be the mid-period between now and 1981. I'm not a construction specialist, and I'm not really in a position to evaluate peak employment and how the crews would be organized and so forth.

Q You assume to be a specialist insofar as land use, population and so forth is concerned, don't you?

A That's right.

Q And so, I assume that going along with that specialty, you would be interested in how many people are going to be employed during any period of time, wouldn't you?

A Yes.

Q Do you know how many people are going to be employed in the mines, so far as coal is concerned, strip mining as a result of units 3 and 4 being built, if they are to be built?

A Well, I don't have that committed to memory.

Q Do you have any idea what it might be?

A Well, if I -- the only idea that I can project, that I can recollect to you, is strictly from my memory, and you'll have to bear in mind that I analyzed those reports, I read the reports on which my judgment was based, some six months or more ago, and I don't recollect the precise numbers of people working in the mine or people on construction crews, or people working in the plants. I do recall that it's substantial compared to the existing population of Colstrip, and the pattern of population in the general area.

Q You didn't refresh you memory before you went on the stand, though, did you, as to these figures?

A Not the employment figures, no.

Q You say it'll be substantial in connection and in relation to the population of Colstrip. Do you know what the present population of Colstrip is?

A You mean including the construction crews that are there now?

Q Yes.

A The present population of Colstrip, as I recall, is something in the order of about a thousand people.

Q About a thousand?

A But here again, I don't -- I did not commit to memory the numbers of population and construction workers.

Q But that's your best recollection?

A Yes.

Q Now, going back to the number of permanent mine personnel that will be employed as a result of units 1 and 2, and 3 and 4 when it goes on line, you indicated it would be a fairly large number based upon the population of Colstrip, or words to that effect; do you recall that? Do you have any idea of whether that figure might be closer to a hundred, two hundred, three hundred, four hundred?

A Which number is this, now?

Q The total mining personnel.

A The total number of people working in the mine?

Q Right.

A I have the impression that, and the recollection that that number is something in the order of five hundred people.

Q That is devoted to mining coal to be used at the Colstrip units?

A Yes.

Q Approximately five hundred. Would it surprise you to know that, actually, the figure total is 222?

A No.

Q On page 10, line 27, you talked about the fact that the state of the art for developing and implementing growth strategies and policies is still in its infancy. What do you mean by that?

A Which line did you say?

Q Page 11 --

A Oh, page 11, I'm sorry.

Q No, I'm sorry, page 10, line 27. It goes over to page 11.

A Well, what I'm describing here in this section dealing with growth management, is a description of where the state of the art is these days, by states in the west, for dealing and developing growth policies. What I stated in here is that it has to be recognized that that effort is now beginning. There's a growing concern on the part of many western states that they must begin to develop better policies and more effective policies, that deal with growth; that it just can't be left to a process of allocating resources to whatever happens next; that states faced with short resources, and a growing complexity of problems, have to begin developing some notion of how they're going to use those resources, and what problems have the highest priority. And what I'm saying is, that that movement is now beginning to occur, and that many states are now beginning to develop those growth strategies, and that's what I refer to as being in its infancy, as that process is now beginning to take place in the west.

Q And you concur in that process and believe it's a good thing, do you not?

A I believe that it is a good thing that states should begin developing growth strategies and growth policies.

Q Page 11, line 17, you say, at present many state policies and programs in Montana are carried out by dozens of federal, state and local agencies, each pulling and tugging in separate and sometimes conflicting directions, and you indicate that this is not a good thing. Now let's call your attention to Montana.

You also included elsewhere, you didn't single out Montana. But, what do you see the situation in Montana today, as far as this is concerned?

A The situation with regard to what?

Q Well, exactly what you stated here: dozens of federal, state and local agencies pulling and tugging, and so forth?

A Well, what I'm referring to here is that, in Montana, and it isn't confined strictly to Montana, but in Montana, as in many places, one unit of the federal government, and another unit of the state government, and perhaps a still different unit of local government, frequently don't have their policies knit together into a single strategy of action, and that it's quite common, at least I discover in my business, it's quite common for many different agencies to be working, if not at cross-purposes, not to be working for the same objectives and purposes.

Q Well, confining your approach to Montana only, what are some of these federal, state and local agencies that are pulling and tugging in separate directions in Montana? Can you name them?

A Well, let's take the subject of land use. The subject of land use is an issue which affects many, many different agencies. A highway division, for example, may have a policy which calls for it to build highways in certain places, to maintain highways in other places, and those decisions affect land use. Environmental protection agencies that are charged with the protection of air, water, and other environmental resources, in carrying out those duties, also end up influencing the use of land.

These are the kinds of agencies that I'm speaking of here that frequently do work at cross-purposes without any kind of a pattern of strategy or direction, and unless the state itself makes some basic decisions about what its priorities are, and what its policies are, there's no hope for that state to bring those strategies and those resources into some kind of conformity and some kind of a conserted direction.

Q Do you know that this is going on in Montana, the situation that you describe here?

A There isn't a government that exists without that going on.

Q So you say that it is going on in Montana?

A Yes.

Q Have you examined this particular point in Montana so that you can give us any concrete evidence? Or examples?

A Well, I mentioned just one in particular: the highway situation.

Q Do you know that's the situation in Montana?

A I know that the highways, and in the construction and the maintenance of highways, the enforcement of air and water pollution controls, the assistance -- the program of providing assistance to local government, that effort combined doesn't work, for example, to permit local government in the state of Montana to work at its best level. And if you're asking for a specific example, that's one example that I can point to, that in order for a local government to be strong and effective, to be able to make some of the basic decisions that a local government ought to be making, and ought to have the resources to make, and in a state where I know the state of Montana gives a high priority to local home rule and self-determination at the local level, there are precious few resources that are given to local government to help them do that. And neither the state highway division nor the state agencies, and for that matter, federal agencies, have as their prime interest the facilitation of that local planning process. And what I'm getting at here is, in this point, on the subject of growth, is that state and local agencies which ought to be in a better position to influence and determine how growth occurs, don't find themselves with the necessary regulatory, financial, legal, and operational wherewithal to be able to carry that out.

Q All right, fine. Now as far as local agencies are concerned, you indicate that in Montana, the local agencies -- what are you talking about, cities and counties?

A Well I refer elsewhere in my testimony to the fact that cities and counties in the state of Montana are left pretty much alone as to how they carry out their planning programs.

Q You realize, of course, that we are a large state with a sparse population, covering a lot of territory, and we have -- do you know how many counties we have in the state?

A I forgot, but something in the order of -- here again, you're pinning me down to some specific numbers, but it's something in the order of -- I don't remember the number, it's something in the order of 30-40, somewhere around there.

Q Well, if we use the figure 56, that's a nice round figure, isn't it?

A Okay.

Q Do you think it's bad that authority in Montana is vested in their local governments?

A No. I'm a strong proponent of effective, strong, functioning local government.

Q You're also a proponent of effective, strong state government, are you not?

A That's right.

Q And you're also a proponent of an effective, strong governmental agency as a group in between the state and the local level, too, if there are such?

A Now I'm not sure what you're referring to there.

Q Well, what about our commissions, and our various boards, and so forth?

A You mean state boards and commissions?

Q Right.

A Well, I consider those parts of the state government.

Q And you feel that they should be strong and have regulatory control?

A Yes, I do.

Q And you believe the same is true as far as local government is concerned?

A Yes.

Q Cities and counties?

A Yes. And that's possible, to be able to develop both a strong level of state government at the same time that local government is made as strong and as effective as it possibly can.

Q All right. Now what would you do in Montana as far as local government is concerned to increase the effectiveness and power?

A Well in the context that we're talking about here, in the testimony that I've given, I speak about land use. I think that's a good situation to talk about as far as functioning and effective local government. I think that, while we like to think that land use decisions ought to be made at the local level, and should be made at the local level, I think that in the state of Montana, there isn't a sufficient amount of financial resource to make that happen, there isn't a sufficient amount of statutory authority to encourage that to happen. The state does not have a land use law. The state does not have an adequate financial base to provide financial wherewithal to be able to permit local government to function effectively. Now you asked me what do I consider a strong situation, and that's one situation that I would consider a problem here, and I've pointed out in my testimony, and I think that that ought to occur at the local level in order to be able to permit local government to function as well as it should.

(ATTORNEY WILLIAM SHERIDAN, JR. JOINED THE PROCEEDINGS AT THIS POINT.)

MR. BELLINGHAM: Sir, I object to the change of the guard here. They sent in a new man that's rested and the old one leaves. I'm not sure that that's --

HEARINGS EXAMINER: Well, the old one hasn't left yet.

MR. SHENKER: The old one is plainly all tuckered out, but he hasn't left yet.

Q Well, as far as financing is concerned, you propose that the state should contribute money to local government in order to help it, as far as this is concerned, this planning and so forth?

A Well, in order to have the kind of strong, effective local planning process that I think is needed at the local level, that costs money, and the resources are needed to provide that money, and if the resources aren't available at the local level, and if the state feels that it is extremely important and has a high priority, then I think that there ought to be some financial resources made available.

Q Well, you paint a rather bleak picture as far as Montana local government is concerned, insofar as your ideas are concerned as to how strong local government should be, don't you?

A No, I don't think I'm painting a bleak picture, because as I mentioned in my testimony, many western states are faced with this same kind of situation. There are some western states, in fact a number, where the states are beginning to take a more active roll in helping local government perform better and become stronger. My observation in here is that Montana may be somewhat behind. I'm not painting a bleak picture; I'm a realist when it comes to dealing with local government and governmental agencies. But at the same time, I think that in order for us to have the kind of strong, effective local government that we say we want, then we should be providing the financial resources to be able to make that government function in a strong way. Now, I'm not saying that local government -- or, painting a bleak picture, by saying that local government in the state of Montana needs strengthening. I think it can be done better, and I'm saying, in particular reference to my testimony here, is that the quality of planning in Rosebud County, which is the case in point here, the quality of planning in Rosebud County has not reached the stage where there is a comprehensive plan. There isn't a plan for Rosebud County, and I think that, as a planner, a professional planner, I'm saying that I believe that that planning process should be functioning, that there needs to be a comprehensive plan, and that there ought to be state support and financial support to be able to make that plan come alive and be creative.

Q Page 12, line 7, you say, management of growth by Montana state agencies seems to be predicated upon the attitude that the status quo should be preserved and any pressures influencing change should be dealt with primarily at the local level. This is the approach that you have taken as a result of your inquiries and interviews, I assume; is that correct?

A That isn't the only basis that I've reached my judgments in this paper. I've examined a substantial number of reports and material that I've received, and I've read this material, in addition to talking with the people that I've noted in my testimony. So, this is not just based on talking to a few people. It's based on a considerable amount of study and thought. That observation that I present on that page, appears in a section dealing with growth, and the growth management process in Montana, and as I said earlier in the testimony, there doesn't seem to be a growth management process, nor does there seem to be any growth strategy, or growth policy for the state.

Q This attitude from the state, you assume is a bad attitude, don't you?

A That the status quo should be preserved?

Q Right. And pressures influencing change should be dealt with primarily at the local level?

A Well, I didn't say it was bad. If I thought it was bad, I think I would have said that. What I'm commenting on here is that the status quo never does get preserved, but the attitude on the part of the state of Montana seems to be that that should be preserved, and that pressures influencing change, ought to be dealt with primarily at the local level. And as I go on to say, there is few instances in the state where growth implications have been developed, but the fact of the matter is, the specific local government that we're interested in here, Rosebud County, does not have the resources to prepare itself, and the lack of a state growth attitude, or growth ethic, or a growth strategy ethic, has not made it possible for places like Rosebud County to prepare itself properly.

Q Okay. At page 12, line 20, you say neither Rosebud County nor the state has prepared itself to deal adequately with the impacts of growth produced by Colstrips 3 and 4. Now, what impacts of growth are you commenting on? What do you foresee?

A All right. I described some of these impacts in the -- later on in this section here, where I -- in fact, the title of that section is subsection C, evaluation of growth impacts, and I detail those growth impacts that were relevant to my analysis, and land issue impacts where one impact on local government, on the ability of local government to serve those kinds of impacts, or the impacts that I evaluated in here, beginning on page 16 in my testimony.

Q All right, fine. Let's take up Colstrip units 1 and 2. Do you feel the impact of Colstrip 1 and 2 has presented a problem as far as the community is concerned?

A Which community are you talking about?

Q Well, Colstrip, of course.

A The community of Colstrip?

Q Yes.

A Well, I think that the development of Colstrip 1 and 2 has been, substantially, what has created the community of Colstrip. The community of Colstrip is Colstrip 1 and 2, and the population that's working to support Colstrip 1 and 2, so I see those as two sides of the same coin, and I'm not really sure what I -- whether or not I understand your question clearly enough.

Q Well, do you realize, as far as permanent operational personnel on units 1 and 2 are concerned, -- do you have any idea how many people that may be, permanent personnel?

A You mean after the construction has gone, and so forth?

Q Yes.

A It's less than a hundred, I know that.

Q Well, do you think that's going to be a real impact upon the Colstrip area?

A The current growth, and the kind of impacts that I'm talking about here, are not just the permanent -- isn't just due to the permanent employment in the power plant. It is the entire growth that will be induced by construction, by the operation of and the construction of 3 and 4, which was primarily the focus here, and the operation of 3 and 4, and it isn't simply the number of employees that will be working in the power plant.

Q Now, you indicated that Colstrip was 1 and 2. You're aware of the fact, of course, that there is strip mining in that area?

A Yes.

Q And a lot of that strip mining produces coal that does not go to Colstrip; you're aware of that, are you not?

A Yes.

Q And that does employ personnel that are not involved in either units 1 or 2, or prospective units 3 and 4; isn't that right?

A That's right. My analysis revolved around 3 and 4, on the subjects of 3 and 4.

Q So we do have other impacts upon the community down there other than the units 1, 2, 3 and 4, don't we?

A Yes.

Q We have strip mining, don't we?

A That's correct.

Q What population increase do you see for Colstrip in the future?

A It wasn't within my analysis. It wasn't part of my assignment, or charge here to make an analysis of the demographics of the area. Other people have made that analysis, and it wasn't part of my assignment to do that.

Q When you say it wasn't part of your assignment, what do you mean by that?

A My assignment, as I mentioned, as stated in the testimony, consisted of three parts: the aspect of growth and how the growth management process is dealt with; the second part had to do with land use and how is the process of land use planning carried out; and the third part had to do with the institutional capacity of government to serve.

Q Well, how can you work upon growth if you don't have any idea what the population change in the future may be?

A Well, I didn't say I didn't have any idea. You asked me what I thought the future population of Colstrip was going to be.

Q You don't have any figure on that?

A In my analysis of this project, it has been confined to the impact that's going to be occurring from the development of Colstrip 3 and 4.

Q So you don't have any idea of what the future population of Colstrip may be?

A Well, sure I have some ideas of what I think the future might be, but it wouldn't be from the standpoint of any informed demographic analysis. I didn't conduct any personal demographic analysis of the area, and that wasn't the intent of my evaluation. I have some ideas about what I think the future growth will be, on the basis of the material that I've read.

Q Would you care to share those ideas with us?

A Sure. I think that the future population of Colstrip, the community of Colstrip, could easily reach three to four thousand people, I would estimate, and I wouldn't be surprised to see it reach that, and perhaps, surpass that, in the foreseeable future.

Q By what time?

A Now here again, we're simply talking on the basis of what my own judgment is on that matter, and I would not be surprised to see the community of Colstrip reaching a population of four thousand or so within the next ten years.

Q Do you think that units 3 and 4, if they are built, would trigger unmanaged growth in Rosebud County?

A Yes, I do. I think it would trigger unmanaged growth. Units 3 and 4, the development of units 3 and 4, would trigger unmanaged growth, yes.

Q Well, what is the solution to that?

A Well, as I pointed out in this particular section on growth management, is that I think, first of all, a slower pace of development of Colstrip 3 and 4 would be a wise consideration. I describe one of the approaches as what I would call a controlled development, not necessarily no development, but a controlled development. And what I'm referring to there is a slower pace of development, primarily waiting until after Colstrip 1 and 2 are complete, functioning, the construction crews are gone, the plant is operating, and an opportunity has been allowed to observe what those impacts will be, and what the growth impacts will be, what the institutional impacts will be, what the land use impacts will be, and then to observe that, and to provide a basis for the governmental processes to adjust so that growth can be handled better.

Q How long do you think that will take after units 1 and 2 are completed?

A Well, I think with the proper regulatory and financial and management processes, I would think that growth and management capability could be built into a governmental process within a five year period.

Q Well, I think the annual employment, construction of units 1 and 2, slated 305 people to work on units 1 and 2 in 1976. That's temporary construction. That 305 is really part of 1976. Five people to work in 1976 upon units 3 and 4. In 1977, no people working on units 1 and 2, 353 working on 3 and 4. In 1978, 1,030 working on 3 and 4; none, of course, on 1 and 2.

A You're talking about temporary construction?

Q Yes. And in 1979, 1,505 on 3 and 4, and none on units 1 and 2. That decreases to 965 in 1980, 205 in 1981, and no one working on the units at all, as far as temporary construction is concerned, in 1982. Now, you feel that that growth, or that impact, is too much for the community?

A Well, what I'm -- yes, I think it's too much for the community. I think that the number of people that will be living in the area from a construction force of 1500 construction workers, is a significant impact on the area, and will tax the ability of government to serve, and will have an impact on the land use of the area.

Q And the fact that that 1500 personnel does not come into the area until 1979, you feel it's still too early?

A Well, at the present time, there isn't a capacity to deal with that growth.

Q But it could be planned, could it not?

A But I think as I mentioned someplace somewhere in my testimony here, that there doesn't seem to be an effort moving at this time to develop that capability. And were Colstrip units 3 and 4 approved today, there would not be the time to gear up that capacity in time to accommodate the growth that would be induced.

Q Even upon the status of the figures that I've given to you; is that right? They'd just come too fast?

A Well, the figures you gave me reach a peak in three years from now, but they begin building toward that peak now, or within a very short time period, and that short time period is not three years, or fours years from now, it's one to two years from now. Government doesn't have the capacity to deal with it now, the legislature won't be meeting for another year, and the fiscal year beyond that legislature doesn't begin for another six months after that, and by the time any authority could be developed, any financing could be made available, or any personnel would be on the ground to start working, it would be just about at the time when that peak would hit, and that's when I say it's too late.

Q You're assuming that they're going to need state help down there. You talked about the legislature meeting, and this sort of thing, so your assumption is that, before anything's done down there, it's going to have to come from state direction and control; is that right?

A No, I didn't say that. I didn't say state direction and control. I said it's going to take some state initiative to help local government perform in the strong effective way that I think many of us would like to see local government perform, and I'm not saying state direction and control, I'm saying state assistance and help.

Q What if you assumed the following fact that Rosebud County Planning Commission -- they do have one down there, do they not?

A County planning commission, yes.

Q Assume that the county planning commission had enough funds to adequately finance a study by a competent land planner who could possibly have a plan out within the next three or four months relative to a complete and overall study of the county, with specific emphasis upon Colstrip and Forsyth, and that that plan was implemented as contained in the plans submitted by the land planner, do you feel that that would come too late to meet the impact of units 3 and 4 upon the county, and the areas concerned?

A Well, the hypothesis that you pose to me strikes me as being more unreal than possible, and the reason why I say it would be unreal, is, first of all, I don't think a competent land use plan could be put together for Rosebud County in three or four months. I would have a great doubt as to the quality of that plan that could be prepared in that short a time. Second of all, there are little or no standards of planning available at the state level, or at the county level, on what that plan should be like, what should that plan do, what is the purpose of the plan, what are the priorities that are going to be going into that plan. A land use plan is, in the final analysis, a policy document, and it's a statement of how the officials in the area, how the people in the area, want that area to be. And that takes time, it takes an adequate staff to produce that plan, it takes a great deal of thought and preparation on the part of the public officials and the people in the area, to develop those policies and those concepts and those objectives, and that is impossible in three to four months.

Q Well, what would be possible? As far as time?

A Well, I think that there are a number of steps that need to occur in order to establish the proper mechanism for a quality land use plan to occur.

Q What time element are we in?

A The time element that it will take either the legislature, or the legislature and the county board of commissioners, together, to develop a set of standards that that land use plan would have to meet up to. That would be the first thing that I would suggest doing, is to set some standards for that land use plan. Second of all, I would -- and how long it would take the legislature and/or the county board of commissioners to develop those standards, I really couldn't guess, but it would take a period of time for that kind of a consensus to occur. The second thing I would suggest happen is, looking more close to the local level, is that the county board of commissioners and the people of Rosebud County, should come to some agreement and consensus on what they want that county to be like five, ten, fifteen, twenty years from now, and that's a process of public consensus, and public deliberation between the officials and the citizens to decide what that county should be like. And from my own personal experience, that takes anywhere from six months to a year in order to be able to properly develop that consensus. There are a great many public interests, there are a great many interest groups, and diverse needs in that area, that the people of Rosebud County should cooperatively develop with their public officials. Once that process is complete, then I think a professional planner, or planners, could develop the necessary data, and do the necessary inventory, take the standards that the state and local government have developed, plus the objectives that have been prepared, and then they can begin putting together a competent, comprehensive plan that will set the foundation for the future of Rosebud County. That entire elapsed period may take anywhere from two to four years to develop. It's taken a long time for us to reach the condition of development where we are in this county right now, and it's quite often overlooked how long it takes to sit down and give a little thought to that process of trying to change it around and come up with a better plan of development and land use.

Q You say it's going to take at least two to four years?

A I would estimate that.

Q And before it can become implemented, you think, beyond question, the legislature's going to have to pass enabling legislation regarding the subject; is that right?

A Well, the reason why I mentioned the legislature and put it in an and/or situation, is that my own personal judgment is that the state ought to express itself on the subject of land use planning in the state. I think the state has a legitimate interest, but that shouldn't prevent, and that need not prevent, the local officials from going ahead. They certainly have the authority, and all of the statutory requirements to proceed with a land use plan. They don't need to wait for the legislature. My reason for introducing the subject of the legislature of the state, is that I think the state legislature does have a role, and I think the state has a legitimate interest here, and I think that the local government, though, can proceed on its own if it wishes.

Q Well, if the legislature decides not to do anything regarding legislation that you have testified to, and the local planning commission goes ahead on its own, acting within the powers that it does have, and proceeds upon a comprehensive plan, how long do you think that is going to take? You're still talking about two to four years, I take it?

A Yes. I think that whether or not the legislature of the state becomes involved, it takes time for the local officials, in this case the county board of commissioners and the planning commission, to develop what it wants to see happen, and it takes time for adequate staff to be recruited, and hired, trained and put in a position where it can begin preparing a competent plan, and I think it'll -- if the state doesn't get involved, it might shorten the period some, but we're still talking about in terms of two to four years.

Q All right, now, page 16. You're talking about the evaluation of growth impacts of Colstrip operation, and you end up with Exhibit 100?

A Yes.

Q You're familiar there?

A Yes.

Q Really, can't we make a statement such as this? It is really not change, or growth, or development which causes the impact, but lack of planning to accommodate and control that change; does that make sense?

A No. There's a force here, and there's an equal and opposite reaction, and I think that, while it's true the lack of planning can make even the most modest growth be a destructive growth, unlimited growth, even beyond the capacity of any plan, even if it's a good plan, can also be destructive too, so I think that both aspects of it have to be considered. I don't think it can be laid entirely on the quality of planning, or the adversity of the growth.

Q Well, page 17, lines 13-21, you're talking about Exhibit 100, and you have fed into that exhibit your own conclusions; isn't that correct?

A Yes.

Q Those are your conclusions, and yours alone; isn't that right?

A That's correct.

Q And you assigned, based on various data, figures in the exhibit?

A Numerical scores is what I've called them.

Q You recognize the fact, of course, that other land planners could very well disagree?

A Yes, I do.

Q With your figures?

A That's right.

Q And you do not hold those figures out as being the only conclusion that could be reached?

A No. Those are mine, that's my judgment, and reflects only my judgment.

Q Typical throughout your work here is language such as appears on the top of page 18, line 2: Unrestrained Colstrip development would place a large burden on local government to provide the needed levels of service. And throughout in here you talk about unrestrained Colstrip development. What do you mean by unrestrained Colstrip development?

A Well, what I'm referring to here were three scenarios, and for the purpose of providing some insight that would permit me to explain my judgments on the process of growth and the condition of growth management in Montana in Rosebud County, I posed three scenarios. One of the scenarios is the one you're referring to as unrestrained Colstrip development. The first scenario that I proposed, or posed here -- didn't propose it, but posed -- was no further Colstrip development, and then the intermediate one was a controlled Colstrip development, and I'm not stating here that that is either a possible or a probable condition. What I'm stating here is a snapshot of -- of a whole series of snapshots, or scenarios that might be described for purposes of evaluation and presentation, primarily.

Q All right. Now will you answer my original question, Mr. Cogan? What do you mean by unrestrained Colstrip development?

A What I mean by unrestrained Colstrip development here in this particular situation, has to do with no controls, no regulations, and no planning.

Q Fine. Now that's the situation that you find down there now; is that right?

A No, I didn't say that that's the situation I find there now.

Q Well, I'm asking.

A No, and I answered no, it isn't.

Q What situation do you find?

A Well, the situation down there now, I don't find any Colstrip 3 and 4, and that's the subject of what I'm talking about here. The 3 and 4 isn't there, and I'm talking about in these scenarios, of three optional scenarios, three what-if's for 3 and 4.

Q Let's get away from the scenarios, and let me ask you some questions. As far as 1 and 2 is concerned, do you consider that unrestrained development?

A I would consider the condition of 1 and 2 closer to unrestrained development than either of my two scenarios.

Q You'd consider it close?

A I'd consider it closer to unrestrained development than either no development, certainly, certainly not that, and I wouldn't call it controlled Colstrip development. I would consider it closer to the condition of unrestrained Colstrip development.

Q How close?

A Pretty close.

Q Pretty close?

A Yes.

Q When you say pretty close, can you evaluate it?

A Well, you see, what the purpose of this scenario and this evaluation of growth impacts from these three scenarios, was to present some judgments, not so much on the three conditions of growth and development, but it was to present more an evaluation of the impacts on land use, on governmental capacity, and so forth. So, the condition that exists now is not what I was describing here, and I really am not prepared to evaluate whether 1 and 2 is unrestrained, or not unrestrained, or is controlled, or is uncontrolled, because this evaluation in this particular section, has to do with the analysis of the impact on growth from three alternative conditions of development.

Q But I'm not interested in subsections, and this sort of thing, and sections as far as your statement is concerned at this particular time. I'm just asking a plain old question that's not connected to your testimony, whether or not you consider 1 and 2 as representing unrestrained growth, and your answer was pretty close to it, and my question was how close to it? Then you refer me back.

A Well, because in trying to answer the question of how close, it's really necessary to say, say on a scale of 1 to 10 --

Q Okay, let's do that. No, let's make it more complicated, let's make it 1 to 100. Any scale you want to do.

A A scale of 1 to 10, I would say that the condition of Colstrip

1 and 2, would be on a scale, on an order of, say, 7 to 8.

Q All right. 10 represents --

A Most unrestrained, and 0 none.

Q You say 7 or 8?

A Right.

Q Now then, say that 3 and 4 come on line. Where does that fit in in your scale?

A Well, if nothing else is done, if no other preparations are made, and I'm talking about from the standpoint of planning, the standpoint of the capacity to accommodate the kinds of growth impacts I'm talking about here, then I would say that the impacts would be greater because of the magnitude. We're talking about a substantial development here, and so the order of magnitude of unrestrained development would be much greater.

Q Let's go back to our dear old scale. On a scale of 1 to 10, I assume then that 3 and 4 would tip it over and get up to 12 or so, is that right?

A I would say it would be 8, say.

Q About 8? 1 and 2 you considered 7 or 8, as I recall?

A Right.

Q And 3 and 4 would bring it up to 8?

A 8 or 9.

Q 8 or 9. That's without any type of planning. Now let's assume, if we might, that we have some competent planners come in that do a good job. What are we looking at as far as the scale is concerned?

A Are these those same planners that are preparing that plan in three or four months?

Q No. Let's assume that these planners know what they're doing; that they're preparing a plan that is adequate, even by your standards, to take care of the development down there?

A Well, all right then, assuming we can set it up the way I've described, and we can take the time that I'm talking about, yes, we're talking about a condition that's closer to the scenario that I call controlled Colstrip development.

Q And that would be fine as far as you're concerned?

A I'm saying it's better. And I'm saying it's better from the standpoint that the governmental agencies, both state and local, have had a chance to accommodate themselves to the kinds of growth impacts that I describe in here, and that's why I say it's better, and if competent planners have the necessary financial resource, have the time, have the support, and have the information, then we could -- a condition of a controlled development similar to what I described in my testimony could be achieved.

Q All right. Let's move over to page 20.

A 20?

Q Yes, at line 20, you say, long-term residents may become losers when they discover they must pay for many of the public costs incurred by the influx of temporary residents, such as construction workers. As far as the taxation --

A What page is that on?

Q Page 20.

A Page 20, line --

Q 20.

A Okay.

Q As far as the taxation situation down there is concerned, do you know what impact units 1 and 2 and 3 and 4 are going to have upon the tax figures in Rosebud County?

A You're talking about on the total tax revenue that would be produced?

Q Right.

A I have read those figures, yes.

Q You haven't studied them, I take it.

A Well, yes, I've studied them, and I know that the projected tax revenue increases substantially.

Q Where did you get those figures? What did you study?

A The figures were in connection with the testimony offered by the assessor of Rosebud County.

Q Mr. Mogen?

A I think that's his name. I don't know him personally, but it's the person who is the assessor of the county.

Q And when did you read that testimony?

A I originally read information -- I read that testimony as such, this week, but I originally read some earlier projections of the same order when I read the original reports.

Q You haven't talked to any of the county officials that are involved in taxation?

A Well, as I mentioned earlier, I have met with the planning director of Rosebud County.

Q You mentioned Mr. Mogen as the assessor. Actually he's an appraiser down there. He's the county appraiser, I think.

A I didn't say his name. The person who testified regarding the appraised values, and projected taxable revenue that Colstrip

-- that would be produced over a period of time in the future with the development of Colstrip 3 and 4.

Q That was the appraiser and not the assessor.

A Okay.

Q Do you have any idea of what the taxable value of Rosebud County is for the year 1975?

A I don't have that number committed to memory, no.

Q Do you have any idea what the total tax is going to be in Rosebud County for the year '75?

A I really can't produce that number from my memory.

Q You know that units 1 and 2, and if built, 3 and 4, are going to have tremendous impact on the taxes?

A Yes, I do.

Q And that's because of their appraised value, is it not?

A That's correct.

Q And as far as those taxes are concerned, they're going to alleviate a lot of the impact as far as this particular point is concerned in the county, are they not?

A No, that's where I disagree. They will, in time, produce the revenue needed for the kinds of services and facilities that the residents of Rosebud County will need and demand, but they will not satisfy the demands in the short-term period, because the demand is already beginning to appear, and those revenues haven't.

Q But, over a period of time, they will satisfy that demand, will they not?

A Well, yes, over a period of time we'll all be dead, too, but over a period of time, the -- that isn't the point. My point in here is the short-term period is going to be a particularly difficult period, and the tax revenue won't be available during that period.

Q Why not?

A Because that tax revenue -- until Colstrip 3 and 4 get built, until they get functioning, and that assessed value is increased, then those tax revenues won't increase according to the projections of that appraiser. So, the long-term pull for tax revenue looks good, I agree. The short-term pull won't be sufficient to produce the revenue to provide the services demanded and needed in the short-term.

Q What do you consider short-term?

A Well, as I mentioned earlier, the ten year period that I was speaking of during this period of accelerated growth and demand for services.

Q What's long-term for you? In excess of ten years?

A That's right. Or, after 3 and 4 are built, operating, and the community reaches the kind of stable condition which I understand the appraiser was projecting as far as tax revenue is concerned.

Q What services are you considering?

A You mean what public services am I talking about?

Q Yes.

A Well, space for medical facilities, say. Police services, school services, all of the services that are required by an expanding population.

Q Well, let's take these things up. As far as medical services are concerned, if a doctor would come into town, presumably he would furnish his own clinic, or his own building, wouldn't he?

A Well, I don't know that that's necessarily true, but I do know that there is no clinic or medical type facilities available now.

Q You do know that there is a doctor that comes to town every week?

A Yes, I do.

Q And you're aware of the fact that in our sparsely settled sections of Montana, that this is a very normal procedure? You're aware of that?

A Yes.

Q Many towns don't have the benefit of a doctor coming in once a week. You're aware of that, are you not?

A That's right.

Q Now as far as school is concerned, are you aware of the fact that a bond issue was passed this year, and that new buildings are going to be built immediately?

A Yes.

Q Last year, I should say, in '75. To take care of expansion. You're aware of that, are you not?

A I'm aware of that, but what I'm not aware of is the -- what is the precise plan and time schedule for -- which will permit the first child to walk into that school.

Q Well, I think the schedule is set forth in the evidence, and it's going to be very shortly, within the next two years is my recollection. Does that surprise you?

A It would surprise me if -- I have not seen that information on when the first child will be able to walk into that school facility, nor am I in a position now to evaluate the adequacy of the facility,of the kind of facility that you're talking about.

Q You don't like the Ken R. White plan, do you?

A No.

Q You think it's a poor plan?

A Well, are you referring -- can we talk about the page that you're referring to here?

Q Well, page 31, generally.

A Line 21?

Q Right.

A That's true, on this page and on subsequent pages, I expressed myself and my judgments on the Ken R. White plan.

Q Well, the reasons that you don't like the Ken R. White plan, are set forth in the testimony, aren't they?

A Well, the reasons that I set down in the testimony present the results of my judgments and my evaluations, but it doesn't set down all the infomration I have on the Ken R. White plan, no.

Q Well, I think you've set down enough to make us realize that you do not like the Ken R. White plan. Are you familiar with the Ken R. White Company?

A Oh, yes.

Q You've run across them previously?

A Yes.

Q What is your opinion of the company?

A My opinion of the company is that it's primarily an engineering company with planning services offered.

Q Do you know whether or not anything has been done down at Colstrip to implement that plan?

A Yes. I've reviewed the plans carefully, both the Ken R. White plan for Colstrip, as well as the material prepared by subsequent architects, planners, and landscape --

Q Fine. You're aware of the fact that there was a joint venture set up to implement the Ken R. White plan, and this consisted of three different groups? You're familiar with that, aren't you?

A That's right.

Q And they prepared a master plan; is that right? Have you reviewed that master plan?

A Yes, I have.

Q I now hand you what is marked as Applicants' Exhibit number 38, and ask you if that is the plan that you reviewed?

A There were several other maps associated with it.

Q What are your thoughts on the happenings in Exhibit 38?

A On the what?

Q On the values.

A On the value of this plan? Well, this plan pretty much followed the -- this was a construction and development plan, more than the original master plan. This plan pretty much followed the guidance and direction that the Ken R. White prepared. And my attitude about the original Ken R. White plan pretty much transfers itself into this plan. You see, not only in my opinion of the Ken R. White plan, but I talked to the person who prepared the original Ken R. White plan, and his viewpoints about that plan were much stronger than mine, as far as dissatisfaction with the quality of the plan. What I presented here was those judgments that I reached from my own personal examination of the plan, and my interviews with the people, the professional planning people who prepared that plan.

Q Well now, getting away from the Ken R. White plan, but referring to Exhibit 38, your dislike for the Ken R. White plan carries over to this one; is that right?

A That's correct.

Q You don't think it's adequate?

A Well, I think it's not adequate from the standpoint of a quality city plan. It's adequate from the standpoint of a company town plan. It's a good map and plat of a company town. That's what I would identify here. Let me add one other thing. This is a plan for the community of Colstrip with 1 and 2 fully developed, and coal stripping occurring. This isn't a plan for the development that would be produced by Colstrip 3 and 4, and I haven't seen any plan, nor have I, at this point, been informed that any plan has been turned in that would illustrate to me what the company -- what the community of Colstrip is going to look like when 3 and 4 are developed, and that was really my charge, not to evaluate the quality of planning for 1 and 2 -- that's history . What my responsibility was, was to take a look at the planning that would occur in Colstrip from the developments of 3 and 4. This is not the plan for the full and ultimate development of the community of Colstrip if 3 and 4 are developed.

Q I think we understand that. Page 32, line 14, you say here, with little or no opportunity to afford diversification or expansion of industry. Are you with me?

A Yes.

Q What industry are you referring to?

A Well, what I was talking about was diversification. That really comes back to the first sentence in that same paragraph, is that it's a company town layout. It's a layout of the town oriented to a single industry: the extraction of coal and the production of electrical energy. There is -- it's entirely oriented to that as the single industry, and there wouldn't be any opportunity in this plan for diversification.

Q What kind of industry are you speaking in terms of?

A It's not the point here in this paragraph to try to come up with an industrial, economic development plan for the community of Colstrip. The point simply was to reinforce the fact that this is a company town layout, and it's a typical company town layout, and one of my bases for identifying it as a company town layout is that there isn't any opportunity to do much of anything else there.

Q Fine. Can we get back to industry again? How much industry do small towns in Montana of the size of a thousand to two thousand have; do you know?

A Well, that's a very broad question --

Q Sure it is, and I'm asking you, do you know?

A I'll have to say that, in general, I guess I know enough to be able to say, in general, yeah.

Q There isn't any, is there, really?

A There really isn't much diversification, but then I'm not analyzing the plans for other communities in Montana. I'm analyzing this plan for the community of Colstrip.

Q Colstrip has an industry down there if you consider 1 and 2 an industry; isn't that right?

A Yes.

Q Well, that's one industry more than most towns have in Montana of this size; do you agree with that?

A Okay.

Q Fine. Isn't it true that our average small town of this size is agricultural oriented, with very little industry; isn't that right?

A That's right.

Q Yet you criticize the plan because of the fact there's no built-in mechanism by which industry can expand under?

A That's not the reason why I criticized this plan.

Q Well, isn't that one of the reasons?

A No.

Q You said it doesn't provide for industrial expansion.

A You're missing the point. This is a company town layout. That's the point, not the point that we haven't permitted diversification to occur; it's a company town layout, and one of the results of that, one of the impacts of that, and one of the qualities of a company town is -- how you can tell a company town from a layout that isn't a company town, is how much diversification is there, how much opportunity is there for diversification. There isn't any. That isn't necessarily bad; it isn't necessarily good. What I'm evaluating here is the fact that this is a typical company town layout. I wouldn't call it a quality plan. That was the original point that I was evaluating here.

Q Fine. Then when you say company town, you're talking about a one-industry town; isn't that right?

A No. You put your finger on the problem. It's not necessarily that it's a one-industry town. A lot of places are one industry towns, much bigger communities than Colstrip. The problem is not that it's one-industry. It's that it's planned, it's developed, it's controlled, and it's pretty well laid out and dictated by one industry. That's the problem.

Q Are you aware of the fact that the company that owns the town is attempting to sell off its interest in the town?

A Yes, I'm aware of that.

Q And I'm sure you're very happy to hear that?

A Well, it's not so much that what their attempting to do -- it's more what's going to happen, and I'd be more interested in what the outcome of that is, more than what motions are taking place to put it into motion.

Q Now, you say the area set aside is available for residential, commercial and recreational development -- it's limited. Are you aware of any statute in the state of Montana that says in platting that you have to set aside a certain percentage of the acreage for park, recreational purposes?

A No. There isn't any.

Q There isn't any?

A No. And what I was referring to here was not so much the -- some statutory limitation, even if there were one.

Q No, I understand.

A What I'm referring to here is my judgment as to the quantity of space available for community facilities and for recreation, and this wasn't just my opinion, this is the opinion of the person who prepared the plan. He didn't have the opportunity to provide that space.

Q The person that prepared the plan is not here to testify, is he?

A No, he's not.

Q You haven't seen him?

A Pardon me?

Q You haven't seen him testify here? You don't know whether he has or not?

A No. I understand that he has not.

Q Now, let's go back. You say that there's no statute in the state of Montana that does provide for certain facilities to be set aside in platting subdivisions for parks or playgrounds?

A That's not the question you asked me. The question you asked me before said, is there a statute that specifies how much is to be set aside, in a percentage. And I said I'm not aware that --

Q You said there wasn't any.

A For a percentage, but there are statutes that identify the fact that there has to be a provision made.

Q Are you familiar with Section 11-3864, Revised Codes of Montana?

A Could you show that to me?

Q I don't have that here, but I can represent to you that it does indicate that, in certain cases, one-ninth the area of the lots less than five acres, have to be devoted to park or playgrounds, and one-twelfth in other instances.

A What is the subject title of this --

Q It provides for platting of residential subdivisions.

A Oh, residential subdivisions, sure. We were talking about community planning standards here, not subdivisions. That's a very typical standard, and nothing unusual. Most counties, most states have regular standards for subdivisions. We were talking about this as a sound, quality community plan, not as some residential subdivision someplace.

Q Were you aware of that statute?

A Yes, I'm aware of that, and that's a very typical kind of a standard for statutes.

Q When did you first become aware of the statute?

A I evaluated these statutes last, when -- those dates that you saw in the early part of my testimony, when I visited Montana, I reviewed those statutes.

Q Do you know how many acres total are found in the town of Colstrip under that plan?

A The total number of acres? I have that in my --

Q Well, 221 acres, approximately, does that ring a bell? Do you know how many acres are reserved in there for park, open space development?

A Again, I have this information back in my office in with my notes, but I don't have it with me.

Q Would you be surprised that it's over 25%?

A For park and recreation?

Q For park and open space development?

A 25% of what?

Q Of the total.

A Of the 200 acres?

Q Right.

A What are you defining as park and open space recreation when you say that?

Q Perhaps you can tell me by looking at the plan.

A Are you talking about schools as part of that?

Q No, I'm talking about open areas.

A Around the community?

Q In the community.

A You're talking about within the boundaries of the community?

Q Yes.

A 25% of that 200 acres?

Q 221 acres.

A 221 acres. Well, I think that if you were to add up all of the space in and amongst the residential units on the periphery, that could be. I was referring in here, in my remarks, in my testimony, not so much about the peripheral space, but of space scattered through the residential areas, which I'm sure is included in that 25%. I was talking about community facilities, open space available for the central part of the community.

Q Well, there are parks in there, are there not?

A Yes, there are.

Q How many parks?

A I don't recall the number, but there are several parks.

Q Do you know anything about the facilities to be found in those parks?

A That are there now, or planned?

Q Planned?

A I've seen the plans that have been prepared, and some of the descriptions for that.

Q Do you know the present status of any of those playgrounds and parks and so forth, what has been done?

A I know there's a construction schedule for the building of some of that, yes. And some of it has been built.

Q You don't know what the present status of that is? You haven't visited Colstrip, I take it, for some time have you?

A Well, the dates that are in my testimony was the last date that I visited Colstrip, last April.

Q On page 32, line 26, you say, it is not the type of plan which would foster a high level of livability and quality of life. On the bottom of the page. And I assume that you're talking about the master plan, as well as the Ken R. White plan? Why? For the reasons previously given?

A Well, the reasons previously given, and the fact that, from the circumstances that I investigated that surrounded the preparation of the Ken R. White plan, and the people who were responsible for preparing that plan, this was not only my opinion, but shared by those people who prepared the plan.

Q I think you've stated that on several occasions, but what would you do with that plan to change it for the better?

A I wouldn't start with the plan. That's the reason why I have to place my evaluation of this more recent plan in with the same evaluation that I put to the original Ken R. White plan, is that you're already starting with a plan with too many restrictions, and too many compromises that have been made already. I think that more time, more money, again the problems that go into any kind of quality planning, need to be made available, than what was made available for the original preparation of this master plan. Very short time, very little money was allowed.

Q If you were to start it, then, from scratch, what would you do, what changes would you make?

A Well, first of all, I would demand more freedom from the company that's dictating the -- how that layout is to be made.

Q I'm not asking you about freedom. I'm assuming that you have freedom. What would you do? What changes would you make?

A You asked me what I would do different, and what I'm saying is I know that the planners who prepared this plan were given very clear instructions how this plan was to be laid out, and I would demand the freedom different from that.

Q Fine. If you had that freedom, and I've asked you, assuming you had that freedom, what would you do then?

A What I'd do then is that I would retain and hire on my staff some excellent designers, and some planners, people who understood environment, people who understood geography, and I would begin -- and I would also sit down with the company officials, I would sit down with the county board of commissioners, and the planning commission, and people from the state level, and find out what is required, what the program is, and what needs have to be satisfied, and I would try to design a plan, not only to satisfy those needs, but to develop a plan that I would consider to be a high quality plan.

Q Well, at this time, you do not have that particular plan in mind, do you, what you'd do?

A No, I haven't prepared that plan, no.

Q You haven't thought about it?

A Sure I've thought about it. That's what I've been doing here for the last -- I have thought a great deal about it, but I haven't prepared an alternative plan, no.

Q I'm asking you generally, though, how you would change it?

A And as I said, I wouldn't change this plan. I would start off with a blank sheet of paper, with original information that I would have acquired myself. I wouldn't begin with the process of planning this community starting off with an inadequate plan.

Q I think we've covered that.

A Well, then, I wouldn't change it. I wouldn't change this plan. I'd say let's set it aside and start off with something new.

Q I'm assuming here that you have authority to do what you want to with that. That's what I'm assuming.

A I'm describing the process.

Q Yes, I understand you are describing the process. But assuming that you went through the process, what would that lead to as far as your own ideas of the town is concerned?

A That's an impossible condition for me to describe. That's like telling a painter to write the specifications for some great work of art before he's prepared the work of art. I'd have to follow through -- I can describe the process that I'd go through, but the materials, the people, the kinds of information -- but I couldn't tell you what that plan's going to look like in its finished form.

Q That's what I'm trying to find out. You cannot --

A But I can evaluate a plan just like a person who understands good works of art can evaluate when he's got a good piece of art and when he's got a bad piece of art, and what I'm saying is, this is a bad plan.

Q I think you've made that reasonably clear, Mr. Cogan.

A I've tried.

Q We understand, but others may disagree with you.

A I appreciate that.

Q You're aware of it, aren't you?

A I'm aware of it.

Q On page 39, paragraph 4, you say, aggravating this issue is the question of precedent surrounding the proposal to develop Colstrip units 3 and 4. This could be a "floodgate" issue opening the way for other in-state electrical generating systems to be permitted to produce electrical energy for export. You make that statement?

A That's right.

Q You're aware of the utility siting act, are you not?

A The major facilities siting act?

Q Right.

A Yes.

Q That's why we're sitting here today, and have been sitting here for some months previously. You are aware of facts, as far as future generating systems are concerned, that they would also have to go through the utility siting act; are you aware of that?

A That's right.

Q So that each individual unit would be decided upon its own merits under that act; isn't that right?

A Yes.

Q And you feel that if 3 and 4 are built, it would result in many more units being built; is that your analysis?

A What I'm referring to here is the fact that there really is no end ever to a demand on resources, and without planning, there really isn't any available capability to consider what the impact is going to be, either from this development, or from other developments which will follow, or could follow. Unless that adequate planning process is developed, unless the governmental agencies have the capacity -- this is in a section dealing with the pressures induced by Colstrip development, and what I'm talking about here is that there is going to be some pressure on the next development to be decided in some sense by this, and what I'm talking about here has to be in context with the section that this appears, and this section has to do with the institutional capacity to deal with growth, and to provide services. What I'm saying is that if this is decided, there'll be an inevitable precedent set without the ability to develop the appropriate governmental and institutional capacity to deal with future projects. And what I'm saying is that we don't have the capacity now to deal with this one, and if this one is permitted to go through, then it'll be on the presumption that the institutional capacity, or the lack of that capacity, is not an important consideration, and that it would be probable, in my judgment, that the next decision after this could occur without the benefit of the full evaluation of the institutional capacity. If it isn't available now, and this is decided, then I don't believe that it's going to be adequately explored and decided on the basis of lack of capacity in the future.

Q Are you confining those remarks to the Colstrip area, or around the state?

A Well, I'm confining -- I said here in the remainder of this paragraph, the problem isn't whether or not Rosebud County will be capable of developing the appropriate governmental institutional capacity, but whether any impacted local or state agencies will be able to keep from becoming overwhelmed. If the lack of capacity and the level to which it's overwhelmed is not a consideration here, then it's not likely to be considered in the future situations.

Q So you do not confine it to the Colstrip area. You think that your approach would be applicable to the state as a whole?

A It's not my approach. This is an observation, and it's based on my observation of what are those pressures that are real here, and what are those pressures that impinge on the governmental and institutional capacities.

Q Now, let's get back to my question again. Do you confine that observation to Colstrip, or does it embrace the state as a whole?

A Well, the issue here is Colstrip 3 and 4.

Q That still doesn't answer the question.

A What I want to say is that the issue is specifically 3 and 4, but the point is, there'll be some other units elsewhere in the state at some future date, and if it were found in those situations that there is insufficient capacity, there is not the governmental wherewithal, there isn't the governmental capability, to cope with the demands placed on those governmental institutions, in those situations -- they'll be less likely considered in those situations if they're not considered here.

Q That's your opinion, is it not?

A That's what it is.

Q Now I think you last visited Colstrip in June, was it, of '75?

A April.

Q April, excuse me. April of '75. You said you haven't been down there since. Have you been in contact with any of the public officials down there since?

A No, I have not been in contact with them.

Q You haven't made any inquiries of any public officials?

A Well, I left an open -- I left the contact I had with the planning director open to the point that he and I would communicate by mail, but I haven't had any other contact.

Q Have you contacted the planning director in recent months at all?

A We haven't had any contact in the last few months, no.

Q Have you had any contact with him since April of last year?

A I received some material from him since April, yes, but we haven't had any in the last few months.

Q Now, when did you write this testimony? I assume you wrote it?

A Yes, I wrote the whole thing.

Q When was that?

A I wrote this testimony during the months of December and January. I've had my notes prepared for some time, but I prepared what you are looking at here during those months of December and January.

Q You indicate at page 33 that no planning seems to have occurred thus far which would anticipate the effects of development of Colstrip units 3 and 4.

A Where is it?

Q Top of page 33.

A Top of page 33, lines 1 through 5 you're talking about?

Q Right.

A This is in my evaluation of the Ken R. White plan, and what I was referring to there is that the comprehensive planning process for Rosebud County has yet to begin in a substantive enough way to accommodate -- to anticipate the effects of development of 3 and 4. That's right.

Q Then you are completely unaware of the fact that on November 1, 1975, a professional planner by the name of Cal Cumin, spelled C-u-m-i-n, was employed and hired by Rosebud County?

You're unaware of that?

A No, I know that. I knew that they had planned to hire a planner. I knew they had hired a planner.

Q When did you find that out?

A I think I had learned of that just prior to his coming. In October, I wasn't aware of the precise date, but I knew that he was coming on.

Q Did you know who it was?

A You mean did I know his name?

Q Yes.

A No.

Q Do you know what he's done since he's been hired?

A Since November?

Q Yes.

A No, I'm not up to date on what he's done since November.

Q You made no attempt to get up to date on that?

A Well, to be truthful about it, when I found out that he was coming on board in November, I've assumed that there isn't a great deal that could be done in a month and a half.

Q Have you inquired of anybody relative to that?

A I was to be kept -- the open ended agreement I had down there was to be kept informed of new events that had some consequence to it, as far as the plan --

Q You haven't been informed of anything?

A I have not been informed of anything that would change my testimony here, no.

Q Well, you haven't talked to Mr. Cumin?

A No.

Q You haven't talked to any of the chairmen of the county planning commission?

A No, that's what I said earlier in the testimony, I really haven't talked to them since we've been talking here.

Q Do you know what he was charged to do? Cumin?

A Cumin? I've seen the description of the work. He was hired under a grant from the Old West Regional Commission, along with some money that came from the U.S. Department of Housing and Urban Development, that was channeled through the department of local affairs. I've seen the contractual arrangements between Rosebud County and the department of local affairs, and in turn, the contractual arrangements with the U.S. Department of Housing and Urban Development, and the Old West Regional Commission. I've seen the work program. I've examined what was to be done first, second, third, and so on, and I've seen what the entire work program was for that comprehensive plan. There was no way that any useful time would be spent for me to examine that progress based on what I saw on that contract, and on that schedule, because, during the first six months of that work program, it was designed to be confined to data collection, information orientation, collection of the necessary reports, and mapping and the like. No substantive plan.

Q You are aware of the fact that he is to prepare a comprehensive county plan for the county? You're aware of that?

A Well, I've been aware of that for some time,that they've had the desire and the plans to do that for some time, yes.

Q And that includes land use, population growth, transportation, and the other amenities that go along with that?

A Yeah, sure. I think it's a good idea. It was encouraging for them to do that, and I'm pleased to see them do it.

Q Do you have any idea when that comprehensive plan may be complete?

A Well, as I understand it, there is going to be some preliminary results coming out this year.

Q Would it surprise you that those results will be coming out within the next 120 days or so?

A It wouldn't surprise me.

Q You haven't made any investigation as to what he's done?

A Based on the information that I have, I haven't come across any information that would cause me to change the judgments I put in here.

Q Well, you haven't made any inquiry of him, though, relative to what he's accomplished?

A Not since November, no.

MR. BELLINGHAM: Thank you, Mr. Cogan.

HEARINGS EXAMINER: Before you redirect, Mr. Shenker, I think Mr. Meloy is looking at me with a jaundiced eye, so Mr. Meloy?

MR. MELOY: Very quickly, Mr. Davis, we would -- I don't think in this proceeding we have made the request to cross-examine the witnesses presented by the Department of Natural Resources. We do so at this time on the same grounds that we made this request in the hearing before the Board of Health.

HEARINGS EXAMINER: Very well, Mr. Meloy. I think it's appropriate to get that in this record. I'm happy that you're making the motion. The motion is denied.

MR. SHENKER: May I proceed?

HEARINGS EXAMINER: Yes, sir, Mr. Shenker.

Redirect, by Department of Natural Resources and Conservation, By Mr. Shenker:

Q Mr. Cogan, I have five items that I wanted to ask you, sir, and then maybe we can get you on that airplane after all. First, Mr. Bellingham inquired of you as to the time frame when you thought that the Colstrip units 3 and 4 would be coming in, and therefore the planning period that you had in mind. You described to him a period between now and 1985. He then told you about a construction schedule that would put the Colstrip units on 1980 and 1981 for generating power. If it were true that the time frame you were looking at is between now and 1980, wouldn't that simply accelerate the pressures on planning?

A Oh, there's no question. I was talking at that time, and Mr. Bellingham was asking me, he was asking me about the -- it was in the context of talking about growth impacts, and the problems from accelerated development. I was terming my observations in a ten year period, and certainly if it's going to be a five year period, that would only aggravate whatever problems would be produced by that accelerated growth.

Q Secondly, what is the relevance of the numbers of workers, or the demography, or the numbers of populace, as far as you're concerned, for the purposes of the analysis that you've made in your testimony?

A It's not directly relevant. The more relevant to my analysis is the overall problems of growth in Rosebud County, not so much the demography of the community of Colstrip, and more relevant from the standpoint of process of land use planning and the problems from the lack of that, and the capacity of the government to provide needed services, more from an institutional format than a demographic format.

Q Third, with respect to the Ken R. White plan, is the Exhibit 33 for the applicants, which you see before you, a master plan in any sense other than architecture, landscape architecture?

A This master plan is a detailed layout of homes, constructed facilities, and the like. These are not the kinds of elements that one normally sees in a master plan. What one normally sees in a master plan are land uses, general layouts of areas of public use, major transportation arterials, and so forth. This is more a plan oriented to the construction and the development of the community of Colstrip than it is the planning of the community of Colstrip.

Q Rather than the impact on the people?

A That's right.

Q In your statement you refer to Carlos Cavanagh, who was the supervisor of John Stanford. John Stanford was the project manager for the Ken R. White Company on the Colstrip planning study. Are those the two folks you talked to who used to be with Ken R. White, and who were involved in the preparation of this plan?

A They were both with the Ken R. White Company in Denver at the time that the Colstrip master plan was prepared. Mr. Cavanagh was the general manager, or the supervisor, of the planning section, and John Stanford was one of his employees, and assigned the job of being project manager of the Colstrip master plan project.

Q Why did you understand that they were dissatisfied?

A Because they told me that. I asked them what their attitude was, and impressions were, about the process of planning, and were they pleased with the product; neither Mr. Cavanagh nor Mr. Stanford expressed any pleasure, and on the contrary, they expressed a great deal of concern that their names were associated with the product. Mr. Cavanagh, as the general manager of a section of planners, was more aware of the time limits and the fee limits, which were very constrained, on the planning process. Mr. Stanford was more aware of the professional limitations which he personally faced, and he was given very explicit instructions on what he could and could not do in this plan. He was given the data. He was given all the demography, all the employment information, all the population information, all of the data that he was to work with. He was given no opportunity to do any original research. He was given that information, given the area to lay out, and told to lay it out.

Q Did he explain his dissatisfaction to his clients at that time?

A He explained his dissatisfaction to the clients, and he informed me that that was listened to, and then he was instructed to proceed with the completion of the work that he was assigned.

Q You've just described, by talking about the information which Mr. Cavanagh and Mr. Stanford were interested in putting together themselves, I take it what you had in mind was the process, the result of which should be a plan; is that right?

A That's right.

Q What are your comments for us, Mr. Cogan, finally, on the suggestion that Mr. Bellingham put to you, that, in effect, this Board of Natural Resources and Conservation should go ahead and certify the Colstrip units, and the planning will come afterwards?

MR. BELLINGHAM: I think that assumes facts that are not in evidence.

Q Let me put if differently, Mr. Cogan. How do you feel as a planner about a certification which would precede the plans?

A I don't think that that fits in with the spirit and the intent of what was formerly called the Utility Siting Act, now the Major Facilities Siting Act. That act explicitly calls for the integration of plans for a facility with regional land use planning, state land use planning, the actual preparation of a master plan of a general area, integration with growth strategies and policies of the community, and of the county, and of the state, and that all states very clearly to me that that planning, those growth strategies, and that land use planning, and the planning of institutional capacity, has to precede certification, and not follow it.

MR. SHENKER: Thank you, sir. Nothing further.

HEARINGS EXAMINER: Mr. Bellingham?

Re-cross, by Applicants,
By Mr. Bellingham:

Q Now, you've testified as to your opinion of what the Utility Siting Act contains, didn't you?

A Yes.

Q Are you a lawyer?

A No, I'm not a lawyer.

Q That is your opinion?

A It's based on what I read in the act.

Q That's your opinion?

A Yes.

Q And there may be others that disagree with that?

A I suppose there are. There would be others. But, the act explicitly states that land use plans, growth plans, and plans of cities, counties, and state governments, state agencies, must be considered in preparing the plans and that the planning of the facility must take that into account.

Q I understand that Mr. Cavanagh and Mr. Stanford are no longer with Ken R. White Company; is that right?

A That's correct.

MR. BELLINGHAM: No further questions.

HEARINGS EXAMINER: Anything further, Mr. Shenker?

MR. SHENKER: No, sir.

HEARINGS EXAMINER: Very well, then. You're excused, sir.

(WITNESS IS EXCUSED.)

HEARINGS EXAMINER: We're going to call next, two public witnesses, but before we call them, I think we're going to have to give Gwen a chance to rest her arm and change the tape, because we've run out of our tape.

(RECESSED AT 2:50 P.M.)

Following a brief recess, the hearing was reconvened at 3:05 P.M.

RONALD H. WILKERSON, appearing as a public witness, having been first duly sworn upon his oath, both as to his written direct testimony and as to the oral testimony to follow, was examined and testified as follows:

HEARINGS EXAMINER: And you are represented by counsel here, are you not, sir?

WITNESS: Yes.

(THE WRITTEN DIRECT TESTIMONY OF RONALD H. WILKERSON WAS DIRECTED TO BE INSERTED AT THIS POINT.)

TESTIMONY OF RONALD H. WILKERSON

My name is Ronald H. Wilkerson. I serve as Manager of Bonneville Power Administration's Kalispell District Office. In that capacity, I am responsible for representing BPA in dealing with BPA's customers headquartered in Montana, other Federal agencies in Montana, State agencies, and various other organizations which have an interest in electric power supply matters.

As a native Montanan, I am keenly interested in the proposed Colstrip Project, both from a professional and personal standpoint. I was born and raised in the beautiful Bitterroot Valley of western Montana. My college work in electrical engineering was at Montana State University in Bozeman.

The issues before the Montana Board of Natural Resources and Conservation are of great concern to BPA as well as the rest of the Northwest. Not only is the outcome of this hearing of great consequence in BPA's planning, but in addition, BPA can make a contribution to the assembly of information presented to the Montana Board of Natural Resources and Conservation for its consideration in arriving at a decision on Colstrip Units 3 and 4.

Because BPA delivers power to satisfy a substantial portion of Montana's electric power needs, because of BPA's leadership and experience with extra high-voltage transmission facilities, and because of our public service responsibility toward effective planning, it is appropriate for BPA to assist the Board of Natural Resources and Conservation by testifying on certain matters.

The Montana Major Facility Siting Act in Section 70-810, Revised Code of Montana 1947, requires that the Board may not grant a certificate unless it shall find and determine, among other things, the "basis of the need for the facility" and the "nature of the probable environmental impact." For the Board's reference, it is upon these matters, need and probable environmental impact, in this case impact of 500-kV transmission lines, that our testimony will focus.

First of all, it may be helpful if I explain BPA's general role in the Pacific Northwest with some elaboration on BPA's activities in western Montana. Bonneville Power Administration is a bureau of the Department of the Interior and is a marketing agent for power produced from 29 existing Federal dams in the region. In addition, BPA will market power from two additional dams which are under construction.

To accomplish its mission, BPA has designed and constructed the Nation's largest network of long-distance high-voltage transmission lines. The system is the main transmission grid for the Pacific Northwest. BPA does not build dams or powerplants. All such Federal facilities are built and operated by either the U.S. Army Corps of Engineers or the Bureau of Reclamation. The power features of the Federal dams, together with the BPA transmission system, are operated as a unit called the "Federal Columbia River Power System."

BPA serves an area including the states of Washington, Oregon, Idaho, and Montana west of the Continental Divide, plus small adjacent portions of California, Montana, Nevada, Utah, and Wyoming. BPA's full service area covers 300,000 square miles and has a population of 6.9 million. BPA has more than 12,300 circuit miles of high-voltage lines and 340 substations. Of its existing lines, about two-thirds of the circuit miles are 230,000 volts or higher.

The transmission grid is connected at more than 100 locations with 17 other transmission systems including three connections with The Montana Power Company system. Besides scheduling and dispatching power from the Federal dams, with a peaking capacity of roughly 13 million kilowatts, BPA wheels or exchanges over its common-carrier grid about 8.1 million kilowatts for non-Federal utilities. In total, BPA supplies about 50 percent of the power generated in the region and has adequate high-voltage transmission capacity to transmit about 80 percent of the region's power. BPA's transmission grid serves as the "backbone" for all interconnected utilities in the region.

The Pacific Northwest regional power supply is the result of cooperative planning by all sectors of the electric power utility industry. Included are the publicly owned utilities, the investor-owned utilities, and appropriate Federal agencies. The planning has been on essentially a "one ownership" basis to insure that facilities are sized, located, and scheduled to meet regional requirements rather than for only one specific utility organization. Consistent with the cooperative planning principles is the concept that during a shortage, if one utility is short, all utilities are short. An interconnected system is similar to a bathtub of water--if it is not full at one end it will not be full at the other end. A shortage of electric energy in the Pacific Northwest Region certainly will be felt in Montana.

BPA markets power from the Federal Columbia River Power System to qualified customers in Montana. Seven cooperatives served by BPA presently deliver power to consumers located in Montana. They are Flathead, Lincoln, Missoula, Ravalli County, and Vigilante Electric Cooperatives with headquarters in Montana; and Northern Lights, Inc. and Fall River Electric Cooperative with headquarters in Idaho. Service will commence to Glacier Electric Cooperative in 1977 or 1978. BPA markets power to one Federal agency in Montana--the U.S. Bureau of Indian Affair's Flathead Irrigation Project at Polson which serves most of the electric needs on the Flathead Indian Reservation. Power deliveries are made in-State to two investor-owned utilities--The Montana Power Company and Pacific Power & Light Company. Two industries are served--The Anaconda Company, Aluminum Division at Columbia Falls and Stauffer Chemical Company at Silver Bow.

During Calendar Year 1975, total sales to BPA customers in Montana averaged

474 megawatts. All power deliveries to Missoula, Ravalli County, Northern Lights (in Montana) and Vigilante Electric Cooperatives are made by transferring the power over transmission facilities owned by The Montana Power Company, as will be future deliveries to Glacier Electric Cooperative.

BPA sold about half of the electrical energy consumed within the State of Montana during the 5-calendar-year period from 1970 through 1974 for either distribution to consumers or for direct use. Only one-fifth of the amount supplied by BPA was generated in Montana at the Hungry Horse Project, the only Federal project in Montana from which BPA then marketed power. The balance, four-fifths, was generated at projects located to the west in Washington, Idaho, and Oregon. During the 5-year period, Hungry Horse generated 10.5 percent of the electric energy consumed in the State. BPA delivers in Montana a substantial amount of energy in excess of amounts sold.

Hungry Horse Dam, by storing and releasing water, is an important part of the Federal Columbia River Power System. Through coordinated operation, it has enabled additional energy generation downstream of slightly greater magnitude than the generation at Hungry Horse itself. BPA expects to continue to supply a substantial portion of its Montana loads with energy generated out-of-state, even after Libby Dam is in full production. This is particularly true during periods of the year when Hungry Horse and Libby are storing water and not generating.

BPA presently provides energy for serving approximately 19,000 residential Rural Electric Cooperative members in Montana and when Glacier Electric is fully served by BPA the total will be in excess of 22,000. A typical residential Cooperative member is a farm family. In addition to agriculture, the industries served by BPA in Montana contribute greatly to the economic health of the State.

A review of load-growth experience of BPA-served cooperatives in Montana shows that they have been experiencing exceptionally high rate of growth. Ravalli County Electric Cooperative, as an example, experienced an increased energy requirement from 37,760 megawatthours in 1970 to 59,000 megawatthours in 1975, an average compound growth rate of 9 percent. During the same period, Missoula Electric Cooperative experienced a 13 percent annual growth, the Vigilante Electric a 12 percent. Much of the rapid growth, particularly by Vigilante, has been due to increased use of sprinkler irrigation to make more efficient use of available water, allowing increased agricultural production.

Summarizing the foregoing discussion, BPA service to loads in Montana provides essentially half of the entire electric energy requirements within the State. Rural residential and irrigation loads are rapidly growing. A severe energy shortage in the Pacific Northwest Region would have drastic effects on Montanans. Not only personal inconvenience and hardships would occur, the economic condition of the State would suffer due to impacts on heavy industry and agriculture.

Next, I will discuss extra-high-voltage (EHV) transmission lines and their typical impacts. Included in the Colstrip Project under consideration is a substantial amount of 500-kV transmission lines. BPA's experience with EHV lines should be useful to the Board in its deliberations.

Historically, transmission lines have been built to operate at progressively higher voltages. With each advance in voltage, larger amounts of energy were moved more efficiently over lines with greater individual capacity. Now the voltage of a single line may exceed 1 million volts, or 1,000 kV.

As of July 1, 1975, BPA had in service 3,293 miles of 345-kV and 500-kV lines. These EHV lines lowered the cost per kilowatt for transmitting energy and reduced the amount of land needed to move a given amount of power. BPA's standard 500-kV line has almost five times the capacity of a 230-kV line; yet each can be built on essentially the same width of right-of-way. Most of BPA's EHV lines are at 500 kV, about 2,600 miles out of the total of roughly 3,300 miles.

Prior to the advent of 345-kV lines, the two more noticeable effects of transmission lines were the impact on land uses and the impact on the appearance of the landscape. Additional impacts encountered in the 1950's when the first 345-kV lines were built included: (1) TV and radio interference during bad weather in areas with marginal reception, (2) audible noise from the line during certain weather conditions, and (3) field effects. The electric utility industry learned to refine designs and to use procedures which minimize these effects.

Looking to the future, BPA is building a 2-mile prototype 1100-kV line this year and expects that such 1100-kV facilities can be designed to keep electrical effects within the same limits established by experience with 500-kV lines.

For your convenience, I will summarize the electrical effects of AC (alternating current) EHV transmission lines.

First of all, let us consider "corona effects." Corona occurs in regions of high electric field strength on conductors and other hardware. Sufficient energy is imparted to charged particles to cause ionization of the air. It results in radio and television interference, audible noise, and the production of oxidants which include ozone and nitrous oxides. Engineers can and do produce transmission line designs which limit corona generation.

Audible noise is created by corona. During all weather, air ionizes near irregularities on the conductor surface. During foul weather, raindrops, snowflakes, and condensation add to the isolated corona sources that exist in fair weather and cause an increase in corona activity. The audible noise, a hissing or crackling sound, then is mostly caused when drops of water form on the surface of the conductor. The sound level near the transmission line depends on the electric field strength at the conductor surface, the size and number of conductors and the weather.

The sound level of BPA's standard 500-kV line during rain averages about 47 dB(A) at the edge of the right-of-way. This is a slightly lower level than light automobile traffic or a little higher level than a typical library. The level decreases, of course, as the distance from the line increases.

Concern has sometimes been expressed about the effect of audible noise on wildlife and domestic animals. A recent study of the effects of a BPA 500-kV line in northern Idaho on migrating deer and elk has shown that maximum line noise levels did not deter elk, deer, and several other species of animals from crossing or foraging on rights-of-way in a manner consistent with their use of other forest clearings.

Much work has been done to understand the audible noise that corona generates. Increasing the size and number of conductors, or decreasing the field strength at the conductor through greater phase spacing, are now used to reduce noise levels. Lines are build with care so as not to nick or scrape conductors. Large metal rings are installed to suppress corona at places such as where insulator strings are attached to the conductor.

Corona on a conductor surface also generates "electromagnetic interference" or EMI, commonly known as static. EMI can disrupt TV or AM radio reception close to a line when the TV or radio signals are weak. In general, TV interference can be lessened by relocating the antenna or by extending an existing TV cable system. FM radio reception is rarely affected. The same measures that suppress audible noise also serve to reduce EMI.

Another source of radio and television interference is arcing which may occur across small gaps in the transmission line hardware. Arcing may occur on any voltage line and can be prevented by good design and proper maintenance.

When corona is present, chemical reactions take place in the small volume of air surrounding a conductor. They include the production of ozone and nitrous oxides. Experience and studies to date indicate insufficient amounts of the oxidants are produced by transmission lines to have any adverse effects on humans, animals, or plants.

Ozone produced by corona on transmission lines is difficult to measure under field conditions due to the minute amounts produced, their rapid dispersal, and ambient levels that vary widely. Studies by Battelle, Illinois Institute of Technology, the American Electric Power Service Corporation, and others conclude that no ozone contribution attributable to 765-kV transmission lines was detected during field tests. Other studies have concluded that ground level ozone contributions from EHV transmission lines are indistinguishable from ambient concentrations.

Next I will discuss "field effects." Field effects from transmission lines stem from electric and magnetic fields at the power frequency of 60 cycles per second, or now commonly referred to as 60 Hertz (Hz), in the proximity of high-voltage conductors carrying electric currents. The high voltage creates the "electric field." Currents flowing through the conductors are the source of the "magnetic field."

Typically, under energized BPA 500-kV lines, the maximum levels of electric field, or voltage gradient, are about 8 kV per meter near midspan at a point slightly beyond the outer conductor, and from 2.5 to 3.5 kV per meter at the edge of the right-of-way.

The presence of an electric field under a transmission line is sometimes demonstrated with a hand-held fluorescent tube. The tube may light up. This phenomenon has been associated with transmission lines and distribution lines. It is also possible to light fluorescent tubes in other ways such as by holding a tube near a television set. In all these instances, the illumination would be much less than that produced by normal use.

The electric field can be accurately calculated for a given transmission line and, therefore, transmission lines can be designed with known field strength at ground level. The biggest factor that influences the maximum intensity of the electric field at ground level is the height of the conductor above ground.

When a conducting object, such as a person or a vehicle, is placed in an electric field, currents and voltages are induced in the object. A person exposed to electric fields of the magnitude found under transmission lines is unable to detect the induced current flows. BPA is not aware of any convincing evidence that indicates electric fields in the range beneath BPA transmission lines pose a biological hazard. No long-term effects attributable to induced currents have been observed on plants, animals, or humans by BPA.

A recent report, however, from Russia indicates that EHV substation workers have experienced problems which have been attributed to the effects of long-term exposure to electric fields. In discussions, the Soviets have informed us that the effects as they identified them disappear in a month when workers are assigned jobs outside a high electric field environment. In contrast, a Swedish study has measured the influence of an electric field on reaction time, attention, memory, and motor preparedness of man. The study reported no significant differences in the performance or the subjective well-being of the test group compared to a control group. The complaints of Soviet workers have not been substantiated by reports from other sources. Both the existence of and the duration of the effects remain speculative.

In the early 1960's the American Electric Power Company sponsored studies of safety practices, field intensities, body currents, and working environments related to high-voltage transmission lines. In one of these studies, a group of 11 linemen who performed hot line maintenance on 345-kV lines were given complete physical examinations at the John Hopkins Hospital over a period of 42 months. The study concluded there were no significant changes of any kind in the general physical examinations and the men remained essentially healthy.

Currently, research is underway on the biological effects of electric fields. More information is being sought to clarify contradictory or inconclusive findings reported by various researchers. No harmful biological effects are expected from exposure to magnetic fields under transmission lines.

These same induced voltages and currents can cause short-term electrical shocks to persons contacting objects such as fences and vehicles under a line. To eliminate these shocks BPA has policies for grounding permanent objects such as fences and buildings in proximity to lines. The clearances of 500-kV lines are such that shocks from vehicles normally can be categorized as nuisance shocks. Spark discharge shocks from persons and vehicles are similar to what might be experienced when touching a doorknob after walking across a synthetic rug. Steady state currents from vehicles normally are near perception. BPA publishes information on grounding in two nontechnical booklets: "Tips on How to Behave near High-Voltage Transmission Lines" and "General Construction and Maintenance Program Statement."

Electrical transmission lines present a potential for electrical contact accidents as do all electrical appliances and equipment. One might jump to the conclusion that a transmission line carrying power with a 500,000-volt potential between conductors would present a greater safety hazard than lower-voltage lines.

This is not the case.

BPA has had no reported incidents of persons or equipment directly contacting energized BPA 500-kV conductors. We believe this is probably due partially to the fact that 500-kV conductors and the towers supporting them are larger in comparison to transmission lines of lesser voltages so that people are more aware of their presence. Also, the 500-kV conductors are higher above the ground than those of lesser voltages.

Aside from the electric effects and corona, the impacts of 500-kV transmission lines are not significantly different than the impacts of lower-voltage lines. Worthy of mention, however, are visual impacts, construction impacts, and impacts upon land use.

A noticeable aspect of 500-kV transmission lines is the increased tower height compared to those of lower voltage. The towers stand taller to hold the wires higher in order to duplicate the excellent safety and reliability records established by lines operated at 115, 230, and 345 kV. An increase in tower height can result in an increased visibility to the public. However, we have found that placing towers below the horizon has greater value to the viewer than reducing tower size.

The only additional impact during construction of a 500-kV line compared to lower voltage lines is the larger tower assembly and the footings. There is little or no measurable difference in the impact of 500-kV lines on land use in comparison with lower-voltage transmission lines. Where the land is used for grazing or dryland farming, the difference in voltage has no effect. The towers are roughly of the same dimension and therefore cause about the same amount of inconvenience to farmers and ranchers using large equipment.

In summary, the environmental impacts of 500-kV transmission lines are well-known and fall within reasonable limits. Proposals to construct 500-kV transmission lines have been adequately presented in a number of BPA environmental impact statements. We continue to add 500-kV lines to the existing transmission system in the Pacific Northwest, and are evaluating the advisability of constructing lines in the 1100-kV class.

EXAMINATION OF RONALD H. WILKERSON

Cross, by Department of Natural Resources and Conservation

By Mr. Shenker:

Q Mr. Wilkerson, by my calculations, you're the 30th public witness to testify in this proceeding, so every ten witnesses, we take a little bit more care in our cross-examination.

A I appreciate that, if I understand you correctly.

Q You're from the beautiful Bitterroot Valley?

A That's correct.

Q You'd like to see it kept beautiful, wouldn't you?

A Certainly.

Q Now, you tell us in your statement, Mr. Wilkerson, that BPA supplies about 50% of the power generated in the region. What does "the region" mean? That's in your statement, page 2, line 25.

A The region that I refer to is the Pacific Northwest, or more commonly referred to, I suppose, in this proceeding, as the West Group Area.

Q That's the Bonneville Service District, and it's in Exhibits 22-A and B?

A I'm not sure of the exhibit numbers, but I'm sure it has been introduced, yes.

Q You were here when Mr. Goldhammer testified, weren't you?

A Yes.

Q The exhibits were offered at that time?

A Yes, sir.

Q You refer, also, in your statement, Mr. Wilkerson, to the cooperative planning by all sectors of the electric power utility industry and federal agencies. Were the states included in that cooperative planning?

A The states have been kept advised of the planning, although they have not been direct participants, because up until now, they have not had a direct utility responsibility.

Q Don't you think it would be a good idea?

A I think it's real wise that the states be involved, yes.

Q You have some interesting metaphors in your statement. There's one on page 3, line 10, where you refer to an interconnected system as similar to a bathtub of water, and I suppose one of the issues that's before us in this proceeding is, where is the bathtub, isn't it?

A I suppose that's correct. The bathtub I am thinking of is coincident with the Pacific Northwest power pool, the West Group Area.

Q I thought so, and I appreciate your clarifying that for us. You also state that Bonneville has sold about half of the electrical energy consumed within the state of Montana. Is most of that energy sold to the Anaconda Aluminum Company and Stauffer Chemical Company?

A Yes, sir.

Q And that is as a result of the decisions in the 50's and 60's to expand the base of the Bonneville sales that Mr. Goldhammer described when he was here?

A I'm sure that's correct, yes.

Q And of course, that sale to Anaconda Aluminum and the Stauffer Chemical Company is at the wholesale preferential rate to an industrial consumer from Bonneville?

A I'm not sure I understand what you mean by wholesale preferential rate.

Q Do you sell it any cheaper to anybody else?

A It's at the filed rate for serving direct service industries, that's correct.

Q Well, do you sell it any cheaper to anybody else?

A No, sir, except for dump energy outside the region, yes.

Q That's when you have a surplus that you hadn't accounted for in your projections and as a result, you're going to take what you can get, right?

A When we have better water than critical or better water than what is necessary to serve the region's loads, yes.

Q And you have better water than the critical almost all the time, don't you?

A Yes, sir, that's correct.

Q You will agree with us, will you not, Mr. Wilkerson, that the state of Montana is a net exporter of energy?

A I'm not sure of that. I would assume that that is probably correct if you consider all forms of energy.

Q You say in your statement, sir, that a severe energy shortage in the Pacific Northwest region would have drastic effects on Montanans. The world is becoming smaller all the time, of course, and a severe energy shortage in the Pacific Northwest region would have drastic effects on a lot of other folks in a lot of other parts of this country, too, wouldn't it?

A Yes, sir.

Q And you're in favor of regional planning, I'm sure, aren't you?

A Yes.

Q In your statement, Mr. Wilkerson, you do not, I take it, speak as a private citizen so much as you do a representative of Bonneville Power Administration?

A That's correct.

Q And I note that in your statement, you do not take an explicit position with respect to the Colstrip units 3 and 4 and the need for them within the overall energy needs of the states of Montana and the Pacific Northwest? That, I assume, was by design, not by inadvertence?

A I'm not sure I understand your question. I do not take a specific position on Colstrip, per se.

Q That's by design, not by inadvertence, is it not?

A I suppose so.

Q Leaving the generating stations aside, the bulk of your statement thereafter refers to transmission lines and the experiences of Bonneville with transmission lines. At page 6 of your statement, lines 19 and 20, you tell us engineers can and do produce transmission line designs which limit corona generation. We all know that that's the case of course, and the real question is, what is the limitation of the corona generation transmission design, isn't it?

A Yes, I suppose that is. The limitation, of course, is the point of tradeoff between economics and other impacts.

Q One of the reasons for limiting corona generation, Mr. Wilkerson, is that ozone formation is also known to occur around high-voltage conductors as a result of ionization of air and water vapor particles, isn't that true?

A It is true that ozone is created by that, but that is not one of the primary reasons for limiting the production of corona.

Q Well, if that helps, then that's a good reason, isn't it?

A I'm sure it helps to some extent; however, the economics involved of power loss is a large consideration, also, as is television and radio interference.

Q Good, we'll talk about those things briefly, as well. The concerns with respect to extra high voltage power lines that the Bonneville Power Administration is building and proposes to build, still continue, don't they, sir?

A I'm sorry, I missed the question.

Q The concerns for extra high voltage power lines that the Bonneville Power Administration is building, and proposes to build, are still continuing, aren't they?

A The concerns of high voltage transmission do continue, because we are strongly considering 1100 kv transmission and so we must be concerned with those effects of extra high-voltage transmission, yes.

Q What is the kv that you expect to use on the extra high-voltage line in the Clark Fork Valley in Montana?

A 500 kv.

Q Were you at the meeting in Thompson Falls on December 14, 1975, at which there was a hearing on those transmission lines?

A I was at a meeting in Thompson Falls. I don't think the date was December 14th, but it was on Wednesday of that week. I think it would have been December 10th.

Q 1975?

A 1975.

Q Were there a bunch of citizens expressing their concern about those extra high-voltage lines?

A Yes.

Q You're sensitive to those concerns, are you not?

A Yes, sir.

Q You mentioned TV interference, Mr. Wilkerson. Were you aware of the study that was done on TV interference at Colstrip in August of 1975?

A No, sir.

Q Doesn't that sound strange to you that in August of 1975, there might be TV interference?

A At Colstrip?

Q Yes. Where are the transmission lines that might cause that kind of problem?

A I'm not certain because of what you have told me that it might have been because of transmission lines; however, you can generate disturbance TVI at almost any voltage.

Q Well, did you know that during that last week in August, 1975, there was testing of the Colstrip generating plant No. 1, which resulted in a measured noise level 20 decibels higher than was usual for the farm and ranch residences outside of Colstrip?

A Is this audible noise, sir?

Q Yes, sir.

A Audible noise that's 20 decibels higher?

Q Oh, excuse me, the TV interference was measured to be approximately 20 decibels higher.

A I'm not aware of that, no, but it's certainly possible. As I say, you can obtain noise from almost any voltage, if it's poorly designed.

Q The deputy sheriff at Colstrip, who previously had been able to talk to his Forsyth office, using his 40 megahertz radio was also unable to hear Forsyth since the first part of August during the testing of Colstrip unit No. 1. Did you know that?

A No, I did not know that, but if it's an FM radio, I'm greatly surprised.

Q Do you know what kind of radio he uses?

A No, sir.

Q You mentioned in your statement, Mr. Wilkerson, that some studies have concluded that ground level ozone contributions from EHV transmission lines are indistinguishable from ambient concentrations. There are also studies which do distinguish ground level concentrations of ozone as higher than ambient concentrations, is that not true?

A Not to my knowledge, sir.

Q Not to your knowledge? Are you not familiar with the study done by the Oak Ridge National Laboratory, of Oak Ridge, Tennessee, operated by the Union Carbide Corporation for the U. S. Atomic Energy Commission?

A No, I'm not.

Q You tell us something about the Soviet's concerns. Mr. Zobel was here. He told us something the Soviet's concerns, too. Were you with him on the trip to Russia?

A No, sir.

Q Ever been there?

A No, I've never been there.

Q Read the papers?

A I've read some articles that describe the papers. No, I've never read the papers themselves.

Q There's something interesting I wanted to ask you about, Mr. Wilkerson, on page 10 of your statement, lines 8 through 11, where you describe current research as underway on the biological effects of electric fields -- on humans, I assume, is that right?

A I'm sure it includes humans, but I don't have a clear definition of exactly what those studies are.

Q How do you come by the statement that says no harmful biological effects are expected? Are you predicting the results of the research before it's over?

A I'm predicting the results of this after discussion and reading a paper produced by Bonneville Power Administration, which makes that judgment.

Q The research is still underway, though, isn't it?

A Oh, yes.

Q You wouldn't want to predict all the results of research until it was done, would you?

A No, but you can predict on the basis of what has been observed so far, and this is the judgment of our engineers who are examining those effects of fields.

Q Let me ask you a little bit about research done by Bonneville. Mr. Ender, of the C. T. Main Company, wasn't able to supply the answer for me; maybe you can. I think it was a study from the Bonneville Power Administration that showed between 52 and 58 dB(A's),complaints may be received, but below 52 dB(A's), no complaints would be received. Are you familiar with that study?

A I'm not familiar with the study, but the numbers sound to be in the right range.

Q The question I wanted to put to you was, it is true, is it not, that the number of people tested in that study, were seven?

A I do not know.

Q You conclude in your statement, Mr. Wilkerson, on page 12, that "Proposals to construct 500-kV transmission lines have been adequately presented in a number of BPA environmental impact statements." When you make those proposals, you would expect to have your engineering work done in order to evaluate the impacts, wouldn't you?

A When we make the proposals?

Q Yes.

A We have sufficient engineering work done so that the impacts can be assessed as to whether they are significant or not.

Q Right. You wouldn't want to leave for the future some further tests that you would want to make on what the configuration or routing of the lines would be, because then you wouldn't be able to assess the impacts, right?

A As you know, our impact statements are presented in two primary phases, and the first phase of our impact statement is presented with work left to be done as to location.

Q And the second phase?

A The second phase deals with the location itself.

Q You have some special standards, do you not, Mr. Wilkerson, from the Bonneville Power Administration, that are specifications for ultimate loading conditions that have bearing upon winds and ice loads for conductors?

A Yes, I'm sure we have specifications. I'm not familiar with those specifications in detail, but -

Q Your office in Portland, and particularly with your assistance in Portland, was kind enough to supply me with substantial amounts of material when we were first hired to come into this proceeding.

A I'm familiar with the fact that we supplied a great deal of information.

Q We certainly appreciated it. One of the documents that I have now was sent by Bonneville in August of 1973 to John Evans, describing tower loading design data, and includes the Bonneville transmission design manual as of September 1970. Do you know whether that's been revised?

A No, sir, I do not.

Q Do you see in that manual where it provides that ultimate loading conditions for medium winds on conductors covered with rime, all tower types for transverse wind on wires, the maximum load should be equal to 40 miles per hour on the wires covered with two inches of radial rime?

A Yes, I noticed that.

Q That's a correct standard, as far as you're concerned, isn't it?

A Unless it's been revised, that is the standard that we presently use.

Q We have chatted from time to time in the past, Mr. Wilkerson, about our mutual friend, who is your boss, Don O'Dell, Administrator of the Bonneville Power Administration. As you know, I went to high school with Don. Do you know whether he's planning on coming to testify here?

A I think he is not planning to.

Q Do you know when he made that decision?

A No, sir, I'm not exactly familiar with the time, but I believe it was approximately two weeks ago.

MR. SHENKER: Thank you very much, Mr. Wilkerson. Nothing further.

HEARINGS EXAMINER: Mr. Meloy.

MR. MELOY: I have no questions, Mr. Davis.

HEARINGS EXAMINER: Mr. Graybill.

Cross, by Northern Plains Resource Council

By Mr. Graybill:

Q Mr. Wilkerson, I am interested in some of your statements about EHV. Have you examined carefully the criteria for the line to be built between Colstrip and Hot Springs? Do you know the nature of the line?

A No, sir, I know that it is to be nominally rated at 500 kV, and is to be built on steel towers.

Q You don't know the size of the conductor?

A No, sir. I know that I have read it, and it's in some of the documents that I have in my possession, but I don't remember.

Q Have you compared it with the size of the conductors that BPA is operating?

A No, I have not.

Q Do you know the minimum height of the line above the ground?

A No, I do not.

Q Do you know the phasing, the distance between the phases?

A No, sir.

Q Do you know the tower span lengths?

A As I said, I have not examined the design of that particular line.

Q So the truth of the matter is that all of the things that you say here about BPA lines, you're not sure exactly how they would apply to the line in question here, is that true?

A The things I say about 500 kV lines are typical effects of a 500 kV line and would be much the same within a certain range of design, regardless of small variations.

Q Well, surely, Mr. Wilkerson, you're not going to say that some of the issues that I've just raised with you, don't make a difference in the EHV effect, are you?

A They make some difference, that is correct.

Q Let's talk about height above the ground. That makes quite a bit of difference, doesn't it?

A That makes some difference on some effects, that's correct.

Q And on the amount of radiation that's received, and so forth, at given points in the right of way, right?

A Radiation?

Q Well, the amount of radiation, the amount of electromagnetic effect, the amount of electrostatic effect, the amount of corona --

A I'm not sure I understand what you mean by radiation.

Q Well, what I'm asking you is, isn't the height of the line a major function of the danger?

A Danger? The height of the line is a function in several electrical effects. Within reasonable limits, I do not think that the height is a great factor in the danger, if you're referring to safety.

Q You don't think it matters from a safety point of view how high the line is?

A Certainly, it does, but within a small range of design variables, it would fall into the same safety --

Q Aren't you aware that the National Electrical Safety Code provides minimums for the very reason that EHV lines are dangerous and therefore you have to have minimums?

A Yes, sir, and I assume that this line would be designed to meet that code.

Q But you haven't studied it, and you don't know?

A That's correct.

Q You say in your statement on page 5 and 6 that 500 kV lines can be built on the same size right-of-way as 230 kV lines. What size right-of-way do you have in mind when you make that statement?

A What size right-of-way?

Q What width?

A 125 feet.

Q In other words, you think you can build a 500 kV line on a 125-foot right-of-way?

A You can build a 125-foot right-of-way line, or you can build one on a 135-foot right-of-way. It depends on your design.

Q Do you know what right-of-way width is going to be used in this case?

A I think I read or recall that it was to be 150 foot per circuit.

Q All right, are you trying to tell this board that a 150-foot right-of-way is necessary for a 230 kV line?

A For a 230 kV line?

Q Yes, sir.

A No, sir, I'm not trying to tell the board that; I'm telling the board that we build 230 kV lines on 125 foot right-of-ways and we can design and build 500 kV lines on that same right-of-way.

Q Aren't you aware that 230 kV lines can be built on less than a 150 foot right-of-way?

A As I said before, Bonneville builds its 230 kV lines on an 125 foot right of way.

Q Well, as a matter of fact, there are a lot of places where there are 230 kV lines on a lot less than that, aren't there?

A Not to my knowledge, on the Bonneville system. There may be some special circumstances that would dictate going to a lesser width right-of-way. We can go to a slightly less width right-of-way if the 230 kV line is directly adjacent to and parallel to an existing line. There is some overlap effect that can go to decrease the additional right-of-way required.

Q Aren't you aware that 65 feet on either side of the centerline is considered enough for a 130 foot kV line?

A 62½ feet on either side of the centerline is what Bonneville uses, a total width of 125 feet for a standard 230,000 volt line.

Q So although you may be building 500 kV lines on that, this particular consortium has not seen fit to try and build it on the same width right-of-way as a 230, isn't that true?

A That's apparently true.

Q What is the reason for the wider right-of-way when you do build it on a wider right-of-way, do you know?

A The reason for the wider right-of-way?

Q Yes.

A I am sure that the tower costs are less if you can design them for a wider right-of-way. The narrow right-of-way has to be a taller tower, of course. You can make a narrow right-of-way and have tall towers, or you can make shorter towers and have a wider right-of-way.

Q Well, is what you're saying in your statement is that if the tower is tall enough, you can build it safely, on the same kind of right-of-ways? Is that what you're trying to say?

A It's a matter of being tall enough to support the conductors the proper height above the ground and also, to be far enough horizontally from other obstacles or structures such as adjacent lines, for reliability purposes.

Q And you don't mean to say, do you, that the right-of-way chosen here is the same as it would be for a 230 kV line?

A No, I wouldn't judge that this right-of-way would necessarily be the same as the 230 kV line.

Q All right, now, you talk about corona effects. What is the effect of weather on corona effects?

A It's my understanding that moisture collecting on the conductor will increase the corona discharge, so that rainy weather, foggy weather, snowy weather, would have more corona discharge than during dry, fair weather.

Q And what is the effect of altitude on corona?

A Altitude?

Q Yes, sir, altitude.

A I'm not sure.

Q Are you telling us that you don't know that there's an effect by altitude on corona?

A This is beyond my field of expertise, and I'm not familiar with the change in corona. I think that I have read that a higher altitude would increase the corona discharge somewhat.

Q What's beyond your field of expertise?

A The specific effect of a change of altitude on the corona discharge of a transmission line.

Q So you don't claim to know anything about that?

A That's right, I'm not a design engineer.

Q Are you aware that this line is built to some rather high altitude locations?

A Yes, sir, and Bonneville has lines in high altitude locations, also.

Q But you don't know what the corona effect is at those high altitudes?

A I presume that the corona effect on the lines which Bonneville has contructed over high passes is acceptable within the limits that are judged to be acceptable.

Q Acceptable to whom, sir?

A To the society that we serve.

Q Pardon?

A To the society that we serve.

Q Well, is there a Siting Act in the State of Washington, whose job it is to see whether or not the utilities are correctly sited?

A I'm not aware of one.

Q You don't know, then, that the Washington lines built by BPA have ever passed the test of an analysis of their siting, is that right?

A They have passed the test of siting by Bonneville Power Administration.

Q Well, but you would agree with me, would you not, that Bonneville's viewpoint and the public bodies' viewpoint might differ?

A I think it would not differ greatly, no.

Q You say here that engineers can do and produce transmission line designs which limit corona generation. Do you know what's been done in the line in question here to limit corona generation?

A I don't know specifically what has been done, but I would assume that the number of conductors per phase that have been chosen have been chosen with that in mind.

Q Now, Mr. Wilkerson, I don't want to argue with you, but I don't want you to guess. I want to know if you know, or if you knew when you prepared this paper, what the engineers in this case had done about corona?

A No, sir, not specifically.

Q So whatever you say in your paper about it is without any knowledge of what has been done in this specific case, is that true?

A The description in my paper for the board's benefit was to describe the Beonneville experience with 500 kV lines, and not to attempt to describe the design of the Applicants.

Q What have Bonneville's engineers done to reduce corona?

A We have increased the surface area of the conductors and we have increased the number of conductors per phase. We have designed special spacers, which hold the conductors apart, which limits corona discharge. We have designed special fixtures which are attached at critical points in the form of a metal ball, in some cases, to reduce the corona discharge. We handle the conductors with great care, of course, to keep from nicking and scraping them up when we're stringing. These are some of the measures that are done.

Q Do you know whether any of these measures have been put into effect on the line in question here?

A I do not know.

Q Do you know what the Ontario Hydro Formula for computing corona loss is?

A No, I do not.

Q If that's the formula used to compute the corona loss on this line, do you have any idea of what that means, or how that's done?

A Since I don't know what the formula is, I wouldn't know the effect it would have on this design.

Q On page 7 of your statement, you talk about noise, and you say that some of BPA's 500 kV lines have 47 decibels at the edge of the right-of-way. How wide a right-of-way are you talking about?

A We're talking about the right-of-way that I believe is a standard right-of-way of 135 feet. The 47 dB(A) is an average; it is not the peak; it's an average during rainy conditions.

Q Were you involved in some sort of a test that tested this?

A Personally, no, sir.

Q Do you know of such a test?

A Yes, Bonneville has made such tests.

Q And were the levels taken at a number of different points along the line or only at one point?

A I do not know.

Q Were they taken when the line was fully energized or when it was energized at less than peak load?

A I don't see the relevance of the question. I don't understand the question. The loading of a line does not affect the corona discharge.

Q I beg your pardon?

A The loading on the line has no effect on the corona discharge.

Q There's been testimony in this case that this particular line can operate at 550 kilovolts. Are you familiar with the 10%?

A You're talking about a different term. The loading I'm talking about is the number of amperes for the amount of power that's flowing over the line, and apparently the loading you're talking about is the voltage level at which the line is energized.

Q Yes. Let's talk about the voltage level. This line can be operated, according to testimony, 10% above or below, and in fact, it's rated at 525 kilovolts in many of the documents concerning it. Now, let's assume it was operated at 550 kilovolts, which is possible, according to the engineers who designed this line. Would that result in a different corona loss from a situation where it might be operated at 450 kilovolts?

A Yes, sir. It would result in more corona loss.

Q So you agree with me that the amount of corona loss is a function of how much voltage is being put over the line?

A That is one of the variables; that is correct.

Q Now, I'm asking you, when this BPA test was taken, when 47 decibels were disclosed at the edge of the right-of-way, if you know what amount of voltage was being put on the line at that time?

A No, sir, I don't, but I could provide that for the record, if you wanted me to.

Q In other words, you don't know whether it was being operated at the maximum or at the minimum rate?

A No, but it could be determined quite easily.

Q But you really don't know what it was when you made this statement, is that correct?

A That's true.

Q And you say this is slightly a lower level than light automobile traffic. What do you mean by that, light automobile traffic where?

A This is a judgment thing that is a difficult one to tie down.

Q Is it your judgment, or is it someone else's judgment?

A It is the judgment of the engineers in our transmission design section, who have described the typical electrical effects of high-voltage transmission in a paper recently, a recently produced paper.

Q In other words, it's not your own personal experience?

A Not my own personal experience, that's correct.

Q And in describing that judgment, did the engineers that made this judgment explain what they meant by light automobile traffic?

A The engineers have provided a table, or a chart, which describes the dB(A) associated with typical sound levels such as light traffic, typical library, and other things.

Q How many feet from the traffic stream was the comparison made?

A This, I do not know.

Q How many cars were involved in what was called light traffic?

A This I do not know. It's a subjective --

Q What kind of vehicles were involved in the light traffic?

HEARINGS EXAMINER: You may finish your answer now.

MR. GRAYBILL: Excuse me.

A I'm not aware of the details of the test. I think it is a judgmental thing and falls within a range which is relatively quiet. It's related, also, to the level in a library and a library, as you know, can vary in sound level, also, but most people perceive a library to be relatively quiet.

Q And of course, that's the reason the comparison was used, because it makes it feel quiet, doesn't it? I'm trying to find out if there's any scientific basis for comparing a library with a 500 kilovolt line at 135 feet. What is the scientific basis for this comparison, if there is any?

A I think it's judgmental. I don't think it's a scientific measurement, although some measurements may have been made during what would be considered light traffic, and some measurements may have been made in what would be considered a typical library. I'm not familiar with the details of the study, but it's the judgment of those who produce the description of the audible effects of transmission that a level of 47 dB(A) would fall somewhere between a typical library and light automobile traffic.

Q Isn't it true that if the insulation or insulators are not in good tight condition, or if there are other mars or marks on the conductor that you can often get corona noise on a transmission line that can be corrected?

A That is true. The maintenance must be kept up to date in order to maintain a good sound level.

Q And if I were out standing by the edge of a right-of-way of a 500 kV line near a loose conductor and heard that buzzing noise, which I'm sure you have heard occasionally, associated with high transmission lines, and made the judgment that it was a little less noisy than in my judgment, the Concord is on takeoff, would that be the sort of judgmental comparison that we're talking about here?

A I'm sure that if you heard a buzzing noise, that it was not corona, and the buzzing noise could come from a 12,500 volt line as well as from a 500 kV line. What you probably heard was arcing noise and loose conductor fixtures. The corona sounds more like a frying sound -- it's more of a sizzling sound.

Q Since I have recently helped to prepare some testimony to the contrary, I'd like to know what recent study it is that you have that shows that deer in northern Idaho migrated across a 500 kV line in the face of corona noise.

A This was a study done within the last three years under contract to BPA, with BPA, under the WICHEY program, and I don't know what the acronym stands for, but it's available if you wish to review it. The study was made in cooperation with the Montana Fish and Game Department and the Idaho Fish and Game Department.

Q Do you know whether or not the line in question was operated at maximum or minimum voltage, when the deer proceeded to migrate?

A I do not know. I assume that that line was operating at or above 500 kV.

Q Do you know whether the animals had a choice, that is, whether one of their basic transportation patterns had been crossed by the line, or whether they had a choice of two ways to go?

A It's my understanding that the study examined the use of elk and deer, perhaps, but elk, in particular, the use of forest clearings, where one controlled clearing, or maybe several controlled clearings, did not have transmission lines through it, and other clearings had the 500 kV transmission through, and the observations were made of the elk browsing or using those clearings for browsing purposes, or whatever purposes, and that they could detect no significant change in the use of those clearings by the wildlife.

Q Do you know whether these tests were taken in all types of weather or only in good weather?

A I do not know.

Q Do you know whether they were taken at different altitudes or only at one altitude?

A I presume they were taken at different altitudes, because they were taken at different locations along the Hot Springs-Dworshak 500 kV line, and I would be glad to provide a copy of that study for you, sir.

Q I wish you would supply it to me. I'd be glad to have it. Do you know whether the study was made on a line with characteristics similar to those in the case here in question?

A Would you repeat the question, please?

Q In other words, was the conductor size, the phasing, the height, the right-of-way, clearance, and all of that, similar to that to be used in this case, or do you know?

A As I said, I'm not intimately familiar with the design used for the lines between Colstrip and Hot Springs, but yes, the situation would be similar. It would be within the same range. That particular line has a three-bundle conductor and in some sections, a two-bundle conductor. I'm not sure which conductor was employed in the test area.

Q I notice on page 7, line 22, that you say that one way to counter TV interference from a 500 kV line is to extend the cable system. Are you familiar with the nature of the terrain through which this line is going in Montana?

A Yes, sir, that statement, as I mentioned before, relates to Bonneville 500 kV transmission lines, and you normally get that problem in areas where there are people living nearby. Most of the problem comes where the line is located close to people around more populated areas, where cable is sometimes available.

Q Surely you don't mean that there's a difference in the TV interference between whether there are a lot of people living near or whether there are only a few people living near the line?

A No, the difference is whether or not there is a TV cable available to extend to them.

Q You'd appreciate, of course, then, that many areas of Montana, it would be absolutely impractical to run a cable system several dozens or hundreds of miles out into the wilderness?

A Yes, sir. I grew up without any electricity lines running to my house.

Q But of course, that's no answer to the fact that a man may now have television and he may lose it by the line, is it?

A That's correct, and in the Bonneville system, we do everything possible in order to mitigate the interference, to a large extent.

Q And where you have cable systems available, that's a lot easier to do than where you don't, isn't it?

A Yes, sir. Not necessarily. I amend that answer; not necessarily -- by cable systems available -- it depends on where the cable system is and how far you'd have to relocate the antenna in order to provide an adequate signal.

Q It's a lot easier to do by cable if there's a cable system in the area?

A That's correct.

Q I notice on page 8 that you talk about the production of ozone and nitrous oxides. Do you know what the ozone does when it mixes with other compounds in the atmosphere?

A No, sir, I'm not a chemist.

Q You're not a chemist. Do you know that it does mix with other compounds to form various other compounds?

A I'm sure that it does, yes.

Q What is the effect of nitrous oxides on grasses?

A I do not know the effect. I assume that in sufficient concentrations it would have an adverse effect.

Q What is its effect on animals?

A I do not know.

Q Are you familiar with the EPRI book called "345 kV and Above"?

A No, sir.

Q Are you familiar with what EPRI is?

A Electric Power Research Institute.

Q Are you familiar with that institute?

A Of the organization? I've heard the acronym and I know what the letters stand for. Yes, I'm familiar with it. Bonneville participates with EPRI.

Q They've put out a handbook on EHV, and are you aware, that in that handbook, it states that there is not enough research done, that there has not been enough research done to determine the effect on humans and animals of EHV transmission?

A From ozone?

Q From ozone, corona, electromagnetic effects and electrostatic effects, all four. Are you familiar with the fact that that particular publication says that there has not been sufficient studies done to determine the effect on humans and animals, of EHV?

A No, I'm not, but I would guess that -- I'm not surprised, because I know that work is continuing on research in those areas.

Q Then what experience have you had to indicate that there is no adverse effect on humans and animals and plants?

A We have operated 500 kV lines for approximately 15 years in the Pacific Northwest. We have in excess of 2500 miles of such lines, and we have not detected any noticeable or any significant difference in the vegetation or animals or humans that have been associated with these lines.

Q Have you done studies to see if there's any difference, or is this just a matter of going out on the line and watching for dead gophers and rodents?

A We, of course, stay abreast of any research that has been done on it and we participate in the various research projects, such as the 1100 kV test blind that we're not building, will have biological studies made in conjunction with that.

Q Are you familiar with the studies that have been introduced in the EHV hearings in the state of New York concerning the effect on humans and animals, of the EHV lines?

A No, I'm not familiar with that testimony.

Q What study was it that you say is the basis for your statement that there is no adverse effect on humans and plants and animals?

A The studies that have been made have been made by Battelle Northwest, Illinois Institute of Technology, the American Electric Power Service Corporation, and others, as far as ozone is concerned.

Q Now, you state there that in those studies, they say that no ozone contribution was detected during certain field tests. Do those studies make the flat statement that insufficient amounts of oxidants are produced by transmission lines to have an adverse effect on humans and animals and plants?

A I think the studies conclude that they couldn't measure the ozone contribution to the ambient situation.

Q I want to know. You said on lines 4 that certain studies have shown that there are insufficient amounts of oxidants produced to have any deleterious effects. Now, I want to know the study that says that.

A Okay. I don't know the study that says that. I can find out a listing of the studies that say that and provide them to you.

Q Would you please provide me with copies of the studies that say that so I can see it in print from someone other than you?

A Yes.

Q Right at the bottom of page 8, you talk about a fluorescent light test. Have you ever seen this test conducted?

A No, sir, but I've seen pictures of it.

Q And you are aware that a fluorescent tube does light up?

A Yes, sir.

Q What causes the fluorescent tube to light up, Mr. Wilkerson?

A The electric field; the changing electric field causes ionization of the gas in the tube.

Q So something is going on at that point, is that right?

A Yes. Just like you can hold it by your TV tube or by your ignition on your automobile, or a number of other places, by your lawnmower, and it will light up.

Q Of course, I understand that, and I understand, you know, that you can turn on the gas in the kitchen and get asphyxiated, as well as from the exhaust of your automobile. Now, my question is, if something is going on there, are you sure that that doesn't harm humans and animals?

A We're not aware that that magnitude of electric field has any significant effect on humans.

Q I can appreciate that you may not be aware of it, but does that prove that it isn't harmful? Are you aware of everything in the world that could be harmful in connection with --

A No, sir, we don't pretend to be aware of everything that could be harmful; however, based on the studies that we have reviewed to date, we do not conclude that they are harmful.

Q Well, I guess we're back to the same question of whether those studies really say that there is no significant danger, aren't we? You have really not conducted any studies that show whether a continued exposure to whatever these electrostatic or electromagnetic effects are, is harmful, is that right?

A No, we, ourselves, have not conducted long-term studies to determine the effect of electric fields on humans or on animals or on plants.

Q And the three studies that you cited in the middle of page 8 concern ozone. Do those studies also concerm themselves with the electrostatic and electromagnetic effects of these lines?

A I'm not aware of just what they cover in addition to the ozone.

Q If a person is filling a pickup truck with gasoline under a high-powered line, do you know how much of a spark is necessary to set off that gasoline?

A No, sir.

Q Have you done any tests as to that?

A Yes, we have done tests.

Q But you don't know the answer to that?

A No. I know we have never had an incident where any flammable liquid has been started from a spark under a BPA transmission line.

Q Does BPA claim that volatile liquids can be transferred in vessels from one to the other under a high EHV line?

A It can be done, but there are certain safety precautions that must be observed.

Q Why?

A To prevent the ignition of the volatile material from a spark that might occur.

Q In other words, you agree that under a high tension line, you can get a spark?

A Absolutely, and we have printed and distributed quite widely a document to the public which describes -- in fact, the title of it is "How to Behave Around High-Voltage Transmission Lines," I believe, and it describes some of these safety precautions that people should take.

Q In other words, you recognize that there's a danger under EHV lines and in handling volatile gases?

A As with any transmission line or high-voltage facility, yes, there are certain dangers; however, as far as direct contact is concerned with a 500 kV transmission line of the 2800 miles we now operate, we have never had an injury or a fatality due to direct contact with the 500 kV line.

Q You're talking about touching them?

A I'm talking about touching with an object or directly, yes.

Q Well, you certainly would agree with me that touching them would not be the best idea, wouldn't you?

A Touching it with an irrigation pipe would not be a good idea, either.

Q What would be the effect of a stream of water from an irrigation pipe striking a high-tension line?

A It depends upon the quality of the water. There are warnings issued, also, as to how close you should be to the conductor with a stream of water, in the document that I mentioned.

Q Are there times during electrical storms when it's dangerous to be under high-tension lines, or doesn't that matter?

A It doesn't matter; in fact, you may be safer under a high-voltage transmission line -- I won't guess on that. Based on my experience in doing lightning research, I would guess that you would be much safer under a BPA transmission tower or off to one side of it than you would standing 200 feet away. The tower offers protection.

Q Do you know, in general, whether the minimum height requirements of the National Electrical Safety Codes are greater for EHV lines than they are for 230 kV and below?

A I don't know, but I know that our minimum height clearance for all transmission lines exceeds substantially the National Electric Safety Code minimums.

Q Well, is the minimum for a 500 kV line greater than for a 230 kV line?

A It would be, yes. I'm sure it would be.

Q Do you know why?

A Certainly, to offer the same degree of protection and safety and reliability as you have with the lower voltage line.

Q In other words, you would agree that as the voltage goes up, there is more danger associated with the line?

A More danger?

Q There is more danger associated with the line?

A No, sir, I wouldn't call it danger. There are reasons other than for danger that you would increase your clearance.

Q For example?

A For example, your electric field effects.

Q Well, isn't that a matter of danger?

A Well, when I think of danger, I'm thinking of being shocked from contact with the line itself, but the minimum clearance does go up in order to provide reliable service and for public safety.

Q Yes, and all I'm asking,is the reason it goes up because there's more danger associated with the higher voltage lines?

A There are more field effects associated with 345,000 and higher voltage lines than there are with lower lines. Some of those effects are controlled by increasing the height of the conductors above the ground, yes. I would not agree that the personal safety of a 500 kV line -- the safety from contact accident is greater with a 500 kV line than with a 230,000 volt line, because our experience has been the reverse. We have not had the rate of accidents and deaths associated with a 500 kV that we have with the lower voltage lines.

Q Could that be because of the knowledge of those that are around them of their extreme danger?

A It could be, but we think it's more because people are aware of their presence; they're more massive in size, so you know, you are aware of their presence, without forgetting and tipping an irrigation pipe up into them.

Q Have you noticed any greater reluctance on the part of people to come into close proximity of a 500 kV line than of a 230 or a 161?

A A reluctance?

Q In other words, are people more concerned and frightened of the bigger lines than of the smaller lines?

A I haven't noticed that, no, sir.

MR. GRAYBILL: Well, I realize that we have some problems this afternoon, and I will stop further cross-examination in the interests of getting this witness off. Thank you.

HEARINGS EXAMINER: Thank you, Mr. Graybill.

Thank you very much, sir. You're excused.

(WITNESS EXCUSED.)

HEARINGS EXAMINER: Mr. Berberet.

WILLIAM BERBERET, appearing as a public witness, having been first duly sworn upon his oath, both as to his written direct testimony and as to the oral testimony to follow, was examined and testified as follows:

(THE WRITTEN DIRECT TESTIMONY OF WILLIAM BERBERET WAS DIRECTED TO BE INSERTED AT THIS POINT.)

VIGILANTE ELECTRIC COOPERATIVE INC.

225 E. BANNACK STREET • PHONE 683-2327 • DILLON, MONTANA 59725

TESTIMONY

Presented by:

William Berberet
Toston, Montana 59643

I am Bill Berberet of Toston, Montana and am a director on the board of Vigilante Electric, a rural electric cooperative, with headquarters in Dillon, Montana.

We support the construction of Coalstrip plants 3 and 4 because we think that people are increasingly turning to the use of electrical energy, not only because of preference, but also because of necessity. We believe it is the purpose of concerned government agencies to see that growth complies with laws, but not to stop growth.

Power supply for our system requires much of our time. Although we buy most of our electrical energy from the Bonneville System, we are dependent upon the Montana Power transmission system for wheeling it to our substations.

We would like to tell you of the growth of our system over the last few years.

In 1970, our peak demand was 6,862 kilowatts and average demand was 5,864 kilowatts. The KWH purchased that year was 33,884,375. By 1975, our peak demand had grown to 16,979 kilowatts, almost 2½ times greater. The average demand for 1975, at 11 619 kilowatts was 2 times greater. KWH purchased at 61,216,954, was almost 2 times greater.

We estimate, from a survey of our members intentions, taken in December, 1975, that peak demand will reach 18,000 kilowatts and average demand 13,000 kilowatts in 1976.

Most of this increase in useage is in irrigation loads, home heating and new members.

Irrigation loads have been the largest increase. In 1970, 162 pumps, totaling 5,888 horse power, used 5,578,691 KWH. In 1975, 374 pumps, totaling 23.231 horse power, used 20,000,000 KWH, almost increasing by 4 times, the kilowatt hour useage.

Pumps in 1970 averaged 36 horse power. In 1975, average horse power was 62. We expect size of pumps to increase and estimate irrigation horse power to raise to 27,000 or more in 1976, with KWH's used to be around 26,000,000. There are thousands of acres in our service area which can, and we believe will, be developed with sprinkler irrigation. Also, most new homes install electric heat and many older homes are converting to electric heat. We believe the increased demand shown by our growth in the last 5 years is going to continue. We believe that many utilities are going to be hard pressed to serve the demands of their consumers if new generation is not built.

We think, because of increased demand and useage, that sometime in the near future, we may be purchasing energy from the Montana Power Company.

What could be more frustrating than flipping the switch to heat and light one's home, cook a meal, etc., and have nothing happen? Or to tell a farmer that he can't irrigate this week as his neighbor is using the power this week?

Can we imagine the useful, necessary useages technology may develope for electrical energy in the next ten to forty years?

We thank you for the opportunity to testify at this hearing.

EXAMINATION OF WILLIAM BERBERET

Cross, by Department of Natural Resources and Conservation

By Mr. Shenker:

Q Mr. Berberet, were you here when Mr. Wilkerson started testifying?

A Yes, sir.

Q Well, I explained to him that every tenth witness gets a little bit extra attention. You're not going to feel bad if we don't give you too much attention, are you?

A No, I'm not.

Q Okay. I appreciate your coming here, sir, and I had a chance to read your testimony before, because it was prepared some time ago and submitted to us. You are speaking on behalf of Vigilante Electric, are you, sir?

A Yes, and myself.

Q Do I misrecollect that there was somebody else from Vigilante who was here testifying earlier?

A I believe there was.

Q It seems to me that was the case. I seem to recall another one of Mr. Davis's clients who was around us. Do you have anything to say different from him?

A I have my statement here. I don't know what his statement contained.

Q So we're not discourteous to your colleague, let's recall his name.

A Briggs, I believe.

Q Yes, Mr. Briggs. He's from Dell, Montana?

A That's right.

Q Have you had a chance to talk with Mr. Briggs about your respective statements?

A No, I haven't.

Q I have just a couple of questions for you, Mr. Berberet. You buy most of your electrical energy from Bonneville. Where do you buy the rest?

A We buy a small amount from the Montana Power Company.

Q As I recall my conversation with Mr. Briggs, you were interested in investigating the possibility of negotiating with the Basin Electric Company to buy some power from them, is that right?

A We may be.

Q And you do say in your statement, sir, that you may be purchasing further energy from the Montana Power Company. Have you investigated other sources beyond Montana Power, Bonneville Power and Basin Electric?

A We have done some negotiating in the Pacific Northwest through cooperatives and private utilities, a combination, on plants.

Q That's a good idea, isn't it, to have some sort of a diverse possibility for a resource base?

A I think you want to look at anything you may be able to obtain any place you may be able to obtain it.

Q And indeed, that is your primary concern, as I understand it, Mr. Berberet, like that of Mr. Briggs, for that matter; you want to get the power, irrespective of the source, isn't that right?

A We want to get the power which will be necessary to serve our members and at the cheapest figure we can get it.

Q Irrespective of the source?

A We'd like to have our power all served by Bonneville as long as they can do it.

MR. SHENKER: I have nothing further, Mr. Berberet. Thank you very much.

HEARINGS EXAMINER: Mr. Meloy?

MR. MELOY: No.

HEARINGS EXAMINER: Very well, you're excused, and thank you for coming.

(WITNESS EXCUSED.)

HEARINGS EXAMINER: Mr. Wilkerson? Did you remember those maps you were going to send us a while back?

MR. WILKERSON: I sent those to you, Carl, at your business address.

HEARINGS EXAMINER: Well, I haven't been home too frequently. Thanks very much. Mr. Meloy?

MR. MELOY: Mr. Davis, may I know at this time your ruling to the Northern Cheyenne motion that this hearing be adjourned and reconvened at the time when the Northern Cheyenne are putting on their case in Billings?

HEARINGS EXAMINER: Yes, I want to address myself to the motion. There's a motion been before me for some time to move the hearing to Billings for the testimony of the Northern Cheyennes, and at this time, that motion is denied and we will continue the hearing here in Helena until its conclusion. Have you got a list of up to date witnesses or exhibits or a time, for planning purposes, of when you would have them, Mr. Meloy?

MR. MELOY: I'm planning on having our statements prepared and served by the end of the week, Mr. Davis. The update of the list, we're not planning on adding anyone; we're planning on deleting three or four people from the list.

HEARINGS EXAMINER: You had 16, so you will have 10 or 12, you think?

MR. MELOY: Yes.

HEARINGS EXAMINER: Do you know anything about the Environmental Defense Fund?

MR. MELOY: I don't, Mr. Davis, no.

HEARINGS EXAMINER: Mr. Graybill was here a moment ago, and I don't know what his schedule is, but I have advised him that I would like to fix the time for Monday, March the 1st, at 1:00 P.M., to start the Northern Plains witnesses; whether that will work or not, I don't know, but he needs to plan for all of his witnesses, and we all need to plan here, too, so I'll communicate that to him, but before I fix that firmly, I want to know if any of the rest of you have any objections to us attempting to do that; in other words, my theory is that we'll finish with DNR and public, and as much else as we can this week and next week, and I realize it will be subject to getting statements filed and enough time so that you can prepare cross-examination, so we'll have to have a certain amount of flexibility on that, but I do have a list of 39 witnesses, a new witness list that they're intending to call. Mr. Peterson?

MR. PETERSON: Well, with that reservation, that the schedule will remain flexible, we won't, of course, have any objection at this time, to fixing that date.

HEARINGS EXAMINER: You go under our schedule, our basic schedule, you come before Northern Plains, don't you, Mr. Meloy?

MR. MELOY: Yes.

HEARINGS EXAMINER: How about the Environmental Defense Fund? Where do we have them on the list?

MR. PETERSON: I don't believe that they are going to appear with witnesses. I thought that Mr. Goetz -- my indication from him was that they weren't going to call anybody, but that may be changed.

HEARINGS EXAMINER: But they're at the last, aren't they?

MR. PETERSON: Yes.

HEARINGS EXAMINER: Well it might be that the latter part of next week, we might get to some of your witnesses, Mike. This is what we will plan on doing, then, hopefully.

MR. PETERSON: Are they going next, after DNR, the Cheyenne Tribe?

HEARINGS EXAMINER: Yes.

MR. PETERSON: And when are they going?

HEARINGS EXAMINER: Well, hopefully, we'll finish with the DNR next week. We'll have to see how it goes the first of the week and plan accordingly. There is no use calling them up here if they can't testify. Our witness load forecasting hasn't worked out too well to date; there are some of the assumptions that haven't proved out.

MR. PETERSON: The Northern Cheyenne, then, will go on March 1st?

HEARINGS EXAMINER: Yes, they'll go on after Health. We've got one Health witness, and maybe two -- if we can work it in that way, but we'll make what adjustments are necessary, I guess. All right, now, for the rest of this afternoon, also, we've got two witnesses under subpoena that are here for the Applicants' side of it and we also have Dr. Shah to complete, who has a flight, so I was thinking about finishing up Dr. Shah and he can get on the plane and we can stay on and finish the other two, but that's up to you folks.

MR. PETERSON: I don't care.

HEARINGS EXAMINER: Is that all right with you other gentlemen?

MR. SHENKER: Sure.

HEARINGS EXAMINER: I talked it over with Leo and he said it would be all right, so let's go ahead with Dr. Shah.

MR. BELLINGHAM: Is the Northern Cheyenne Tribe, may I ask, going to present written statements?

MR. MELOY: With the exception of Mr. Norco, whose statement will be prepared by himself, because of the problems that the Northern Cheyenne have in communicating well in the English language, I'm going to prepare a descriptive statement for each of our witnesses, which will tell you, Mr. Bellingham, what they're going to be testifying about. They will testify, though, primarily, in an oral manner. I don't think that's going to cause much of a problem, because I don't expect them to spend too much time, and each witness will have a fairly short statement.

MR. BELLINGHAM: Are those statements going to be in Northern Cheyenne, or are they going to be in English?

MR. MELOY: They're going to be in English, Mr. Bellingham.

HEARINGS EXAMINER: Are you ready to proceed with cross-examination, Mr. Bellingham?

MR. BELLINGHAM: Yes, sir.

DR. K. R. SHAH, having previously been called as a witness by the Department of Natural Resources and Conservation, and having been previously sworn upon his oath, was examined and testified as follows:

CONTINUATION OF EXAMINATION OF DR. K. R. SHAH

Cross, by Applicants

By Mr. Bellingham (continuing):

Q Dr. Shah, shall we proceed?

A Do you want me to make the calculations?

Q How long will it take?

A Two to three minutes.

Q All right.

(PAUSE.)

Q Dr. Shah, when we adjourned this morning, when you were on the stand, we were talking about Puget Sound Power and Light Company, do you recall?

A Yes, sir.

Q I direct your attention now to this particular exhibit. In Exhibit 209 attached to your statement, you have attributed 22 megawatts to combustion turbines throughout the entire period covered by the exhibit?

A Yes, sir.

Q Also, you have attributed 20 megawatts to Shuffleton and Crystal Mountain?

A Yes, sir.

Q Do you know what Shuffleton and Crystal Mountain are?

A Let me check.

Q I think you will find that those are oil-fired generating units, not turbine.

A I do not have the record at this time, whether this is oil-fired or not.

Q You do not?

A I do not have the record at this time.

Q I have been informed that that is a Diesel-powered generator. Do you have the revised exhibits for Puget Sound?

(MR. BELLINGHAM GIVES EXHIBITS TO WITNESS.)

Q I'd like to ask you what figures are attributed to those units in Applicants' Exhibit No. 18-B, revised?

A This is about the Shuffleton and Crystal Mountain?

Q Yes. We're talking about average energy.

A Right. It's 9 megawatts they have down.

Q Nine megawatts attributed to Shuffleton and Crystal Mountain, is that right?

A That is true.

Q And the combustion figures; what is the figure there?

A Nine megawatts.

Q Now, then, turn to Exhibit 233, if you will, please, and calling your attention to Puget Sound, you see there, that there is attributed in that, under Shah, average megawatt requirements of 42 megawatts?

A Yes, sir, I noticed that.

Q And applicant companies, 18?

A That is true.

Q And the difference is 24. Will you quickly look at the number of barrels of oil per year, and the cost of oil per year, and see if those figures seem to be reasonable?

A Seems reasonable.

Q At page 20 of your statement, you indicate there on line 6, that "we feel that Puget Sound Power and Light Company's projection of the number of customers is high, but energy consumption per customer is low." Why do you make that statement?

A This is based on our analysis of the number of customers that we anticipate and the number of customers that they gave us.

Q You do not say there what relationship there is, if any, between the number of customers and the population, do you?

A I can give it to you now, if you want.

Q All right.

A The number of residential customers that we have estimated in this vary from 385,000 in 1975 to 442,750 in 1985, and the number of commercial customers, its upper limit is from 39,926 in '75 to 45,915 in 1985.

Q All right, now turn to page 21, if you would, please, starting with line 5. You indicate that "the growth of number of residential customers depends generally upon the population increase in Puget's service area." Then you go on and say, "The U. S. Department of Commerce projects for the next ten years population increase for the state of Washington lf 15%, while USN (U. S. News, I assume that is) and WR projects 5.8% increase in the same period."

A Yes.

Q Now, you assume, don't you, that the population growth in Puget's service area is the same as that predicted by the two sources indicated there on page 21?

A I have done this, that I have taken the upper limit and the lower limit, and the limit I have given you is the upper limit, which is the 15% growth, which is the highest growth, that I can allow.

Q That is the upper limit, and not the low?

A No, the lower limit varies from 385,000 in 1975 to 407,330 in 1985.

Q You're talking about the U. S. Department of Commerce?

A Right.

Q Now, you say 15%, the upper limit?

A Right.

Q What is the lower limit in terms of percentage, do you know?

A No, I did not compute this in terms of the percentage, but what we have done is that the number of people, 15%, is the upper limit; the lower limit is 5.8%, and based on that, we computed the number of people per customer.

Q Well, what I wanted to know, though, is what the lower limit is as far as the U. S. Department of Commerce projection is? You don't have that?

A They do not give the lower limit.

Q They don't give one?

A No.

Q They just give the 15%?

A They just give the 15%, so what we did, we have two different estimates and we give the highest possible one that we can.

Q What was the highest estimate given by the Department of Commerce? Do you have that figure?

A It's 15%.

Q Turning to page 20, you don't indicate -- just pages 20 to 22, generally -- your formulas for predicting loads do not take into account your population predictions, per se, do they?

A Yes, it does.

Q In what fashion?

A What we have done is that, as you can see, these equations, we use the upper limit and the lower limit. In the upper limit, we have all the population projections which is upward; in the lower limit, we have all the population projection which reflects the number of residential customers as the lower limit, and in the final analysis, you will see that we have taken the upper limit as the final value and given the full value to Puget Sound Power and Light Company.

Q You have assumed an increase in the number of customers equal to the predicted population increase of 15% during the time, did you not, basically?

A Yes -- no, not exactly 15%.

Q It comes close to it, though, doesn't it?

A When you reflect, what we did is that we looked at the various counties in the Puget area and found out what is the number of households and what were the people in that area and then the ratio of number of people per household and then implemented the number of people by 15% and then based on that, we extrapolated the number of households, that is, number of residential customers.

Q Didn't you assume the increase in the number of customers would equal the increase in population, basically?

A No, this is a function of it.

Q Now, I have just a few more questions, I think. Turning to Exhibit 209, and here we're talking about Puget Sound --

A Yes, sir.

Q You've added there -- let's see now -- Colstrip 1 and 2, you have used the figure of 350 megawatts nameplate rating, have you not?

A 150 plus 100 which comes out to be 250 megawatts, and the share of Puget is 350.

Q But you used a basic figure, to start with, of 350 megawatts nameplate, didn't you?

A I used the 350 nameplate rating and then, based on the analysis I did on page 36, we came up with these numbers.

Q Well, the net capability, actually, of those plants, are 330 megawatts. Were you aware of that?

A No, we have been given 350 megawatts.

Q By whom?

A Well, this is from our conversations with the Puget people, and also, the same information we have used with Montana Power Company.

Q That's right, you did, but Montana Power uses a net capability applicable to those plants of 330. You're surprised, I understand, to hear that?

A Let me check, okay? I have used 350, but let me now check it out.

(PAUSE.)

A Yes, we have used the 350 megawatts.

Q If you take a look at a Montana Power Company exhibit, I think you'll find that they have used 330 net capability.

A No, Exhibit No. 207, the same thing we have done.

Q Well, those are your figures, and you used the same nameplate rating that you did for Puget, isn't that right, for Montana Power?

A That's right, exactly.

Q Now, Montana Power indicated to you it used a 330 net capability, and if you'll look at their exhibits there that you have, I think you will find that that is the situation.

A Let me look at Puget's estimate. Yes, Montana used 330 megawatts.

Q They used 330? You're talking about Puget now?

A Montana Power Company and Puget both.

Q -- have used a net capability of 330, so that changes the figures between yours and theirs, doesn't it?

A It changes by a small amount. 'Montana Power plus Puget total 32 megawatts, approximately.

Q Oh, no, it would be a 40 total for Montana Power, wouldn't it?

A Let us see. We are talking about 85% operating availability, so if you consider that, take that into account, so the difference is -- we are talking about 700 in one instance, and in the other instance, we are talking about 660, so 40 times 85 will give you -- 34 megawatts.

Q 34 total?

A Total.

Q Okay. Now, as far as Corette is concerned, you have used an availability factor of .89%, of 173 gross rating, or 154 megawatts. Am I correct on that?

A Now, which one are you talking about now?

Q Corette. You come up with 154 --

A Are we going to now Montana Power Company?

Q Yes, 207.

A Yes.

Q And you've used an availability factor of .89% of 173 gross rating, which is equal to 154 megawatts?

A Right.

Q Now, then, actually, Montana Power, I think you'll find in their figures, use 163 megawatts net, rather than 173.

A What we looked at is the nameplate rating, and many companies are saying this, they do not have uniformity in reporting.

Q Right.

A And as a result, we asked the nameplate rating, and based on the nameplate rating, we used the data.

Q Fine. Well, Montana Power Company, as I have indicated, did not use the nameplate rating and I think they have used a figure of 163 megawatts net rating as far as Corette is concerned?

A It is their thinking, and what we were doing is to see whether that made sense to us or not, and once a nameplate rating is given, they cannot think that something is better.

Q Well, the nameplate rating is basically also termed gross rating, isn't it?

A Well, it depends upon what rating you're talking, because there are many, many different ratings.

Q Well, would you check and see if Montana Power uses a 163 megawatt net rating for Corette? I'd appreciate it.

A They have 180 megawatts on peak and 157 megawatts on the energy.

Q How much?

A On peak, 180 megawatts --

Q Right, but we're talking about energy here.

A On energy, they have 157.

Q Well, if we used 163 megawatts net and applied your factor of 89% of that, we would equal 145 megawatts, would we not?

A Then I have 157. Do you want to open up another hypothesis?

Q I was applying your factor of .89%, as used on page 36, against 163 megawatts net rating, and that would equal 145 megawatts?

A But I don't have that here in this. I do not have that in my figures here.

Q Well, on your Exhibit 212, for example, if, for example, and we're talking here about -- taking 212-F, if, for example, we proceeded upon the basis, that all five generation figures used by the companies, the difference between their figures that they attribute to them, and yours, and the difference in gross and net as to Colstrip 1 and 2, your figures, as far as surpluses and deficits shown on your Exhibits 212 -- and I'm talking about the entire one -- would be reduced, isn't that right, if we used the philosophy approach used by the power companies as far as their figures applicable to the oil-fired generating units are concerned, isn't that right?

A Yes, if that stipulation is made, it would be.

Q And also, that would apply as far as the turbine generation is concerned, too? Those figures would be reduced accordingly? If, instead of using your approach to the megawatt readings, the coal-fired and the turbine units, that would follow the approach and the philosophy of the applicant companies?

A Here, you are making an assumption that oil or combustion turbines won't be available for generating the energy.

Q Well, I'm following the assumption that it would be as stated on Exhibit 233, the applicant companies' figures apply to that?

A What Exhibit 233 says, the total cost of the dollars that you have developed --

Q Yes, but I'm talking about the first section up above. There is a difference, you see, there, in what the applicant companies use for the ratings of these units, and what you use?

A Yes.

Q And if we followed the applicant companies' ratings, then the projections in your Exhibits 212 would be reduced, as far as surplus is concerned, and would be increased, as far as deficit is concerned, would it not?

A That is true; however, I would like to make this clear, also: when we started developing the analysis, Portland General Electric had given 650 megawatts on their energy to generate on average energy basis. They had their resources, which were consisting of the oil-fired or combustion turbines for generating average energy. Now, after one year, you are telling me here that they have changed their mind, and with that stipulation, I agree with you, that the surplus or the deficit should be changed.

Q Right -- and that's true of each company?

A Right, with that stipulation.

Q Now, then, you will recall that I requested you, in the presence of your counsel, before we came on here, if you would figure out for me the figures that you have produced in your exhibits, and I asked you if you would figure out for the 9-year period or for the 10-year period that you project in your exhibits the average annual load growth compounded of each individual company, as well as the total composite, is that right?

A Yes, sir.

Q And you were kind enough to do that, and I think you have those figures now, do you not?

A Yes, sir, with the help of Don and everybody, I got them calculated, and I've got the numbers if you want. I can report.

(MR. BELLINGHAM GOES TO DRAWING BOARD.)

MR. SHENKER: Bill, why don't you just read them out, and you can have it written out later?

MR. BELLINGHAM: I'd like to have the exhibit out.

MR. SHENKER: Sure, sure.

Q For the Montana Power Company -- and now I am applying, looking at your exhibit, and attached to your written statement -- you have in there several sets of figures. One is your own forecast, isn't that right?

A Yes.

Q And as far as Montana Power Company, what is the annual average load growth for this period, from 1975-'76 to 1984-'85, as far as the GAI forecoast, your own forecast, is concerned? Do you have that figure?

A Yes. It's 4.66% on the energy and 4.72% on the peak.

Q Fine. Now, then, as far as Portland General Electric, what is the average figure?

A 9.1% upon the growth on energy and 9.17% on the peak.

Q What was the energy, 9.1%?

A 9.2%.

Q Now, what about Puget?

A 5.11% on energy and 5.1% on peak.

Q And what about Washington Water Power?

A For Washington Water Power, I have 4.45% on energy and 4.63% on peak.

Q What about Pacific?

A For Pacific Power and Light, I have 5.12% on energy and 4.74% on peak.

Q And what do you have as a total composite?

A The total composite growth is 5.9% on energy and 5.96% on growth -- on the peak.

Q You wouldn't have those reversed, would you?

A Let me verify --

Q Well, you have a total composite of 5.90 on energy, is that right?

A Yes.

Q Well, I think that figure is .96 --

A Okay, 5.96 and 5.90.

Q 5.96 on average energy and 5.90 on peak, is that correct?

A Right.

Q Turning now to the applicant companies' analysis that you put together in your exhibits, and going down the line, what do you have for Montana Power?

A I have for Montana Power Company 5.55% on energy and 5.16% on peak for Pacific. For Portland General Electric, 7.17% on energy and 7.22% on peak; 6.06% on energy and 6.06% on peak for Puget Sound.

Q 6.06%?

A Right. For Washington Water Power 6.22% on energy.

Q How much?

A 6.22%. No, I'm sorry, there's something wrong here. One minute -- oh, 4.5% on energy and 4.7% on peak.

Q All right, fine.

A And for Pacific Power and Light 6.22% on energy and 6.1% on peak.

Q And composite?

A And composite is 6.17% on energy and 6.14% on peak.

Q All right, thank you, sir. You, in your analysis, have the applicant companies having a peak shortage in the years to come, do you not?

A This is the Exhibit 214 that you are referring to?

Q Yes, I think so.

A Yes, in Exhibit 214, it says there will be a shortage on peak, yes, sir.

Q And the applicant companies, of course, do not show that peak shortage, but have it in the energy capacity?

A Well, again, my assignment was not to look at what they have done; my assignment was to look at it objectively.

Q Can we safely assume that a lot of that difference is because you are calculating the megawatt ratings of the oil for generating units and the turbines in a different manner than they are?

A Everything won't account for that.

Q But it plays a great part in it, doesn't it?

A Well, there are two things; one is the load forecast and the other is the resources, and what I have tried to do is to rely on the EEI data and on the general picture of the availability of oil, and looking at this, I have given the resources that I thought reasonable, because one year, Portland General Electric could account for 650 megawatts of energy and one year afterwards, they cannot, and this is a little beyond my understanding.

Q I'd like to call your attention to the Portland exhibit, which is Exhibit 19, and that one has a date on the bottom of it of April '75, and I think you'll find the combustion turbines there are rated 293 and not 650. Do you have that?

A In my opinion --

MR. SHENKER: Mr. Davis, I'm going to object to the third time that this evidence has been tried to splatter itself upon the record. Mr. Bellingham keeps using revised exhibits and unrevised exhibits. Dr. Shah keeps telling him it's not the material he got from the company, and I don't think we're doing anything with this record except larding it.

MR. BELLINGHAM: This is the first time that the Applicant --

MR. SHENKER: Now we're back to Exhibit 19, unrevised, the Portland General Electric Company, revisited for the third time.

MR. BELLINGHAM: No, that is not correct. Well, let me proceed further.

Q What figure do you have there?

A This is the figure that was given to me, except there is this 2/6/75.

Q What is the figure there?

A This is on the Portland General Electric Company system loads and resources, critical hydro conditions.

Q What is the figure, though, as far as combustion turbines?

A Combustion turbines, for 1979-'80, are 650 megawatts, on energy.

Q Then the exhibit in April shows a decrease on that. Now, I'd like to call your attention to page 42 of your discussion of available alternatives. You have recommended some alternatives there, and the first one is to install peaking and base load units to meet peaking and energy shortages from the operating year 1980-81 to 1984-85 for the companies, as well as from '77-'78 to '84-'85 for Montana Power, and also, that generation-mix studies be conducted to determine optimum combination of peaking and energy resources for both the applicant companies combined and Montana Power Company before exact capacity of peaking and base loads units are established, and so forth. Well, now, don't you think that Montana Power Company has been involved in studies to determine just these things?

A I do not know. This was not part of my assignment.

Q But their load and resource section, this would be a normal function, would it not?

A Well, not all utilities have this type of analysis.

Q We know that Montana Power has, don't we?

A You know, I don't know that.

Q But this would be a normal function, isn't that right?

A Yes, it is supposed to be a normal function, but it is not strongly adhered to by many utilities.

Q Well, each company has a full-time planning staff, you know that, each of the applicant companies?

A Yes, but I do not know whether this has been undertaken or not, and this was not part of my assignment.

Q Well, it would have been unusual if they hadn't gone into this?

A I wouldn't be surprised if they have done it.

Q Well, do you think it's practical to spend the amounts of money contained in Applicants' Exhibit No. 233 a year for oil insofar as the future is concerned?

A Can you tell me how the optimum size of 700 megawatts was arrived at?

Q What?

A Can you tell me how this optimum size of 700 megawatts was arrived at?

Q Well, that's a long story.

A I was aware of the cost estimate of the fee case and I know that fact.

Q But our Exhibit No. 233 that you looked at indicates a tremendous expenditure, doesn't it?

MR. SHENKER: I'll object to that. It's not in evidence.

MR. BELLINGHAM: Well, you've looked at it, have you not?

WITNESS: Yes.

Q And it does show a tremendous expenditure each year to keep these generating units on line that are using oil?

HEARINGS EXAMINER: I think if you rephrase the question about the fact that that type of generation uses a lot of oil --

Q This type of generation, then, uses a lot of oil, doesn't it?

A The oil-fired units, you mean?

Q Yes.

A Yes, it does.

Q And the expenditure for oil can be a great figure each year, depending on how long you run them, is that right?

A The operating cost, you mean?

Q Right.

A Yes.

Q Particularly if you use them as base load units, isn't that right?

A Yes, and I can remind you that there are many companies in the East who are using it.

Q But not too many in the Pacific Northwest?

A In the East, they are.

Q But not in the Pacific Northwest?

A I don't know.

Q Do you consider gas turbines as base load units, generally?

A No, I don't.

Q Turning to No. 2, page 42, improvement in system load factor by implementing load management controls, now, really, this applies to peak only, doesn't it?

A Yes, sir.

Q It does not apply to energy?

A That is true.

Q If the companies, for example, did not conceive that they were going to be deficient in peak, that would be reason enough for not implementing load management control, wouldn't it?

A That is true.

Q Actually, Colstrip is being built as an energy facility, and not as a peak facility, isn't that right?

A This is my understanding.

Q And load management controls only affect peak in an advantageous manner?

A Yes, sir.

Q Several studies have indicated that although the English utilities were able to increase their load factors with load management controls, and therefore, partially alleviate peak difficulties, such load management controls actually increased net energy use. Are you familiar with that conclusion at all?

A No, I am not familiar with that conclusion.

Q Is it possible, would you say?

A Yes, it is possible.

Q All right, No. 3, on page 44 -- actually, we're concerned more with these companies on energy as far as our deficits in the future are concerned?

A My analysis shows that you are concerned with energy and peak.

Q I think the companies' do too, but they are more concerned about energy than they are peak.

A Well, you ask them.

Q Well, I think that's indicated in the exhibits.

Now, as far as No. 4 on page 45, really, when we're talking about availability, generating plant availability, the companies have every motivation to increase the plant availability, isn't that right?

A Yes, they have, but as you can see, the record, and if you look at the reference I have given here, the Federal Power Commission, Bureau of Power Staff Report, entitled "Electrical Generating Plant Availability," that does not speak that high; otherwise, they would not have come out with the report.

Q But to go back, companies do have a motivation to increase plant availability because it cuts down their overall costs, isn't that right?

A Yes, and it increases the energy output from the plant.

Q No. 5, you have, "Purchase peaking power from the Northwest Power Pool, if possible." If there's none available in the future as far as the forecasts are concerned, that's not a very good alternative, is it?

A That is true, if it is not available; however, I do not know what is the situation.

Q And you don't know whether Bonneville peak is available in the future or not?'

A No, I have not investigated that aspect.

Q This, of course, has nothing to do with energy; you were talking there about peaking power?

A Yes.

MR. BELLINGHAM: No further questions.

Redirect, by Department of Natural Resources and Conservation

By Mr. Shenker:

Q Well, we know that Bonneville peak is available, don't we, Dr. Shah, because it's uncontroverted evidence, which I will ask you to assume, between now and 1990, there is no peak need in the Pacific Northwest, and if that's true, sir, turning to your Exhibit No. 214 -- that's your key exhibit, isn't it, Exhibit No. 214?

A Yes, this is the key exhibit.

Q If I just told you is true, do you have any peak problems for these five companies?

A No.

Q Of course, that fits with one of your proposed recommendations No. 5, purchase peak power from the Northwest Power Pool, doesn't it?

A Yes, sir.

Q Let me go through in order the points that I wanted to ask you about in Mr. Bellingham's cross-examination. There are not very many of them. I'm going to ask you to keep your answers as short as possible, because we both want to catch airplanes.

A Okay, I certainly want to do that.

Q The first point was, Mr. Bellingham was asking you about all these newfangled factors that evidently some utility companies are considering and some are actually using. Now, the fact of the matter is, is it not, Dr. Shah, that none of the five applicant companies are actually plugging into their load forecasts any calculations with respect to the effects of conservation or price-elasticity or cross-elascity?

A That is true. I have not been shown that they have done that, in the past.

Q Whatever they're considering, hasn't helped the load forecast that they have available as of this time, isn't that correct?

A What I could say is that I did not see that they are using the effect of all of these factors.

Q Mr. Bellingham asked you if you were critical of the companies methodology. Your answer to him was that generally speaking, you were not so critical of the companies' methodology, which has been satisfactory in the past. If they continue the same methodology for continuing the projections of load in the future, would you be critical then?

A Yes, I was suspicious about the load forecast.

Q Mr. Bellingham was also asking you about what he persisted in calling your opinion, of what the Edison Electric Institute has compiled by way of its experience on fossil-fired generating stations of various megawattages. Is it your opinion, or is it the fact of what the Edison Electric Institute reports, that there are various availabilities that go upward as you have smaller megawattage units available?

A As I mentioned, the fact, as given by the Edison Electric Institute, about the operating availability of various units, my opinion is, if I were an officer of the company, then I would recommend that there be higher operating rates than what EEI has recommended.

Q As a Commonwealth Associates engineer, Dr. Shah, specializing in energy planning, have you actually prepared the designs for generating stations with higher availability rates than shown in the EEI figures?

A Yes, we have done that.

Q Now, Mr. Bellingham was also asking you about these new revised forecasts which I had sent to you as soon as they were made available to me, a few weeks ago, and which you looked at last night after you arrived here in Helena. It's fair to say, is it not, that all of those forecasts on behalf of the companies revise their loads downward?

A Yes, sir.

Q It is also fair to say, is it not, that all of those forecasts revise their surpluses upward and their deficits downward?

A This is what it looks like.

Q Now, in that situation, Dr. Shah, if you had looked at their material most recently submitted, what effect would that have upon your own analysis?

A That would have changed some of my equations, probably, and certain trending.

Q And would have had the effect, would it not, of producing on your own conclusions, greater surpluses and lower deficits than you actually found?

A Yes.

Q Now, your assignment was given to you by me, was it not?

A Yes.

Q And I instructed you, did I not, to take at face value the numbers given to you by the applicant companies on what they said were their load forecasts and resources?

A That is true, yes, and in one case that I remember for Boardman coal, I was later told that this is a coal-fired unit and not a nuclear unit.

Q Because you were told it was a nuclear unit?

A This was our understanding. This was the understanding that I got.

Q No matter whether you, doing a load forecast and resource analysis for an applicant company, would have come to some other conclusions and argued with their figures, you weren't permitted to do that under my assignment, were you?

A That is true.

Q So what you have compiled and put together in final form in Exhibit No. 214 is based upon your uniform approach to the figures supplied to you on face value by the applicants?

A Yes, sir.

Q Now, Exhibit No. 214 shows, does it not, Dr. Shah, looking only at energy, since that's the only one of concern to us here, for the year 1981 and 1982, is the only deficit in any of the decade, isn't that right?

A This exhibit shows deficits in energy and also in peak, too.

Q Yes, but I'm saying, look only at energy for Exhibit No. 214. That's all we're concerned about now.

A Okay.

Q The only one year in which there is an energy deficit is the year 1981-1982?

A That is true.

Q And it's 125 megawatts, isn't it?

A Yes, sir.

Q Dr. Shah, is it sound energy planning to build 1400 megawatts of base-loaded coal-fired generating capacity to service 125 megawatts one out of ten years?

A In general, I would say no; however, again, I have to say that I have not made the analysis of each of the power companies' available generating capacity and production cycles and maintenance periods, so I cannot say whether the peaking load they are going to obtain is the only peaking load they will want or this is the only energy they will want.

Q As far as this business concerning oil-fired units is concerned, of course, the assumption that underlies the rates that were tossed at you for your immediate calculation, is that that was a 28% deficient unit, isn't that right?

A Yes, this is what it comes out.

Q Now, the Colstrip units are variously described in testimony that we've had before us -- but of course, you've done your own independent analysis in another proceeding -- as having a cost of something around one billion dollars for the two generating stations and the two sets of transmission lines, as we look at them right now. Just assume that cost for right now. Is it a fair assumption?

A Yes, sir.

Q Assuming that plant cost of one billion dollars, what are the annual fixed costs for an appropriate return upon investment and interest on money?

A If you consider some 14 to 15% prime rate plus 6% rate on the investment, so say about 20%, then about $200,000,000 in capital investments for a year.

Q And looking only at fixed costs, without even considering a dime for operating costs, would that be more expensive than operating oil-fired stations?

A Based on the exhibit given here, it looks that -- yes, it would be expensive.

Q More expensive?

A More expensive.

Q Of course, if you factor in operating costs, more expensive, even, than that?

A Yes.

Q Now, the last question I want to ask you, Dr. Shah, is with respect to the load growth calculations that you instantly made at Mr. Bellingham's beck. Those calculations, of course, are again based upon the applicants' numbers and their load forecasts and their resource analyses, aren't they?

A Yes, sir. It is based on their load forecast and our load forecasts.

Q Okay. Based on your forecast and theirs, from their numbers, you have given us what anybody could have done supplied with a calculator, in actually computing what the growth rates were on the average, isn't that true?

A Yes.

Q Now, Dr. Shah, have you studied the growth rate projections that you would make for the Pacific Northwest or for the mountain regions of these United States?

A No, sir.

Q Is it possible for someone to do so?

A Yes.

Q Would it have been possible for you to have done so had you had that assignment?

A Yes, I would have done it.

MR. SHENKER: I have no further questions. Thank you.

Re-cross by Applicants

By Mr. Bellingham:

Q Dr. Shah, did I understand you to say that unit 3 and 4 are going to be more expensive in the long run than utilizing oil-fired generating units?

A No, I didn't say that. What I said is that he posed a question, what is the return on a one billion dollar investment, and if you consider 20% interest plus rate of return combined, then it will cost $200,000,000 per year for a plant worth one billion dollars, and comparing that with the prices you have given me on Exhibit 233, which is $145,000,000, approximately, there is a $55,000,000 difference in the two.

Q How much?

A $55,000,000, approximately.

Q Have you analyzed this, to come up with this figure?

A Which figure?

Q That you were just talking about now.

A This is the hypothesis that Mr. Shenker posted to me.

MR. BELLINGHAM: All right, thank you, Dr. Shah, that's all.

HEARINGS EXAMINER: Very well, thank you, Dr. Shah.

(WITNESS EXCUSED.)

HEARINGS EXAMINER: Now, we have two other witnesses here. Mr. Graybill?

MR. GRAYBILL: Mr. Peterson, I'd like to ask, unless you object, that you call Mr. Coates first, since he has an airplane to catch, too.

MR. PETERSON: All right.

MR. SHERIDAN: Mr. Davis, we'll offer Mr. Cogan DNR Exhibit 100 and for Dr. Shah, DNR Exhibits 200 through 206, 206-A, 207 through 211, 212-A through J, 213 through 215.

HEARINGS EXAMINER: Very well, those exhibits will be admitted and we'll mark this blackboard exhibit, 234.

MR. BELLINGHAM: And I will add the figures to that. There will be no objection, subject to checking by opposing counsel if that's satisfactory.

HEARINGS EXAMINER: Very well, at that time we'll admit it then, unless there is some objection on the figures.

MR. SHERIDAN: One other matter, Mr. Hearing Officer, I served a corrected copy of Mr. Fred Barrett's testimony upon Mr. Peterson. We had omitted in the transcription of the original statement a portion, and the changes were on line 20 on page 3, continuing through to line 14 on page 4.

HEARINGS EXAMINER: Very well. Mr. Coates.

LESLIE E. COATES, having been subpoenaed as an adverse witness by the Applicants, and having been previously sworn upon his oath, was examined and testified as follows:

EXAMINATION OF LESLIE E. COATES

Direct, by Applicants

By Mr. Peterson:

Q Would you state your name, please?

A Leslie E. Coates.

Q May I have your address?

A Route 1, Box 46, Forsyth, Montana.

Q Are you a member of the Rosebud Protective Association?

A Yes, sir, I am.

Q How long have you been a member of that association?

A Since its origination.

Q And when was that, Mr. Coates?

A Approximately two years ago.

Q Are you an officer or director of the association?

A No, sir, I'm just a member.

Q Are you a delegate from that association to the Northern Plains Resource Council?

A Yes, sir, I am.

Q What is that function?

A I'm just elected as a representative from the Rosebud Protective Association to serve on the board of the Northern Plains Resource Council.

Q Are you a member of the Northern Plains Resource Council also?

A Yes, sir.

Q Mr. Coates, on or about January 22, 1976, did you prepare a news release for dissemination to the public in the state of Montana via TV?

A Yes, sir, with help from the staff of Northern Plains, and so forth, we got together and worked up this news release, and I looked it over and decided that -- I mean, this was one of our big concerns.

Q Yes, sir, I understand that. I just wanted to go into it a little bit on the news release. When was the news release prepared?

A I do not recall the date.

Q Who were the gentlemen that worked on the release with you from the staff of Northern Plains?

A I worked with Gene Tuma on it, I worked with Mr. McRae on it, and he was a past chairman of the staff, of course, at the time. I think this was all, sir, really.

Q Was it prepared in written form for you?

A Well, we talked about it and the staff prepared this and I read it then, and then we submitted it to the press, on my approval.

Q Where did you or the staff obtain the information that was included in the news release?

A Well, from various departments. We received information from the Karp-Klarich draft study, pages 72 and 73, and from the Westinghouse study, and from the California State Water Control Board, dated 1963, from R. W. Hossley Company report signed by B. A. Chinkley, and also, from a study done by the Department of Health and Environmental Sciences, from M. K. Botz.

Q Did you rely on any of the testimony that was in the record of these hearings, Mr. Coates?

A Having not heard much of it, no, sir, I haven't.

Q Have you ever read any of the testimony, sir?

A No, sir, I haven't.

Q None of the transcripts?

A No, sir.

Q In the statement, I believe you discussed matters relative to the cooling water storage pond, do you remember that?

A Not precisely, sir, no.

Q Do you remember stating in the news release that the company's cooling water storage pond which they resealed and claimed wouldn't seep, started leaking 600 gallons a minute?

A Yes, sir, I do recall this.

Q Where did you get the information that the company claimed that the cooling water storage pond would not seep?

A This was information I received from the staff of the Northern

Plains Resource Council, which I think was submitted to them, just how, I don't know.

Q You didn't check it out yourself, sir?

A No, sir, I relied on them for information of this type.

Q Where did you obtain the information that the trace element pollutants would dissolve and leach out of the waste over time as the water moved slowly down through the material and that it had never been determined what the trace elements would be?

A It's hard for me to come up with this right now, because --

Q I understand that you got this material from the staff of the Northern Plains Resource Council?

A Yes, sir.

Q You don't have any independent knowledge of that material?

MR. GRAYBILL: I'd like the question repeated. I didn't hear it, Mr. Peterson.

Q I asked whether he had any independent knowledge of that material?

MR. GRAYBILL: Of what material?

MR. PETERSON: That I was just inquiring about, trace elements. We want to know what trace element pollutants would dissolve and leach out of the waste over time as water moves slowly down through the material. This has never been determined.

MR. GRAYBILL: Then I'd object to the question as not comprehensible. I don't understand if the witness has made a statement that he wants to know something, how he is held to have known it.

Q What were you discussing in that statement then, relative to trace elements, Mr. Coates?

A Through the seepages, and so forth, of these ash disposal ponds.

Q Did you obtain any figures relative to the seepages?

A Yes.

Q Do you believe, Mr. Coates, that the seepages from the waste disposal ponds are the same as the seepages from the cooling water storage pond?

A No, sir.

Q They're different?

A Yes, sir.

Q Did you explain to the public in your statement the difference between those two ponds?

A Not in my news release, no.

Q And with regard to the waste ponds, I believe you made the statement that the bentonite clay can crack and may not do the job over the long run. Do you remember that?

A Yes, sir.

Q Where did you get that information?

A Sir, this information is from practical experience from being in the country, for one thing.

Q You have, in fact, yourself, used bentonite clay to seal ponds?

A I have used it to try to seal ponds.

Q And what method did you use?

A Well, in sealing the core of the dyke, we always pour a dyke. We take the topsoil off and then apply this clay to it and then we pack it, to try to get a seal on it, for our stock water use ponds and things of this nature.

Q Mr. Coates, do you know what grouting is?

A Not for sure, sir.

Q Do you know whether or not the ash or disposal ponds are grouted with any type of bentonite or claylike material?

A Would you explain grouting to me?

Q Well, it's a method by which the clay or the bentonite is mixed with water and has been forced into the cracks or the porous material and then hardens, and seals the area.

A Now would you repeat your question?

Q Do you know what the procedures the applicants, or Bechtel, are using at Colstrip to seal the porous areas by grouting?

A No, sir. The only thing that I know on this is with talking with people down there, that the lining was just put on with machines.

Q Do you remember making a statement, also, in your news release, that there are high concentrations of the trace element, boron or barium?

A Yes, sir.

Q Which did you use, boron, or barium?

A Boron, sir.

Q Where did you get the figure, 2,000 parts per million?

A From one of these -- I do not recall right now, sir.

Q Was that provided to you from the staff of the Northern Plains?

A Yes, sir.

Q What was the purpose of issuing a news release at that time, Mr. Coates, rather than presenting these matters before the

Board of Natural Resources?

A Well, sir, I became concerned about this quite a while ago. We're all deeply concerned about what's going to happen with our soils and water and so forth in the area after these ponds are put into use, and after receiving some of this information, and reading it myself, we got together, and my main intention in this was to bring it to the public's eye, to let them know what possibly might happen in this area, to our ground water, to our soil, to our livestock, in the event that these things do happen.

Q You did, however, relate all these matters to Colstrip 3 and 4 in your statement, did you not, and specifically, in fact, mentioned Colstrip 3 and 4?

A Yes, sir, but they would also apply to Colstrip 1 and 2.

Q Did you mention Colstrip 1 and 2 in your statement?

A I do not believe I did, sir, no.

MR. PETERSON: That's all I have. Thank you, Mr. Coates.

HEARINGS EXAMINER: Mr. Graybill.

MR. PETERSON: I'll object to Mr. Graybill having the right to examine this witness as an adverse witness under the rules that there is no procedure to allow for the cross-examination or redirect examination of an adverse witness.

HEARINGS EXAMINER: Overruled.

Cross, by Northern Plains Resource Council

By Mr. Graybill:

Q Mr. Coates, do you believe that the material you included in your press release was true and accurate, to the best of your knowledge?

A Yes, sir.

Q Have you had considerable experience in the area with the nature of the terrain and the nature of the soil?

A Yes, sir, after living there for some 20 years, I know a considerable amount about it.

Q You're aware that seepage occurs in that country when water is allowed to stand on the surface?

A Yes, sir, due to the content of the soil, which is real porous, we cannot hold a stock pond for any length of time at all. We cannot rely upon -- I don't know what percentage it would be, but 75% or 80% of them, anyhow, aren't holding water long enough to do us the good that we want them to do for us, as far as watering livestock.

Q Didn't you get the impression that the applicants were claiming that ponds they sealed down there wouldn't leak?

A Yes, sir, this was the impression I got, and this was one of the Department of Health's conditions of certification, if I am not wrong, that there would be no seepage on them, and no seepage to me means zero, not ten gallons per minute or 110 gallons a minute, but zero.

Q Are you aware that during the summer the engineers for the applicant companies discovered that there would be considerable leakage from several of the ponds?

A Yes, sir.

Q And that they made a report to the Department of Health that confirmed that there would be leakage from these ponds?

A Yes, sir, I think it was Bechtel Corporation that provided this information.

Q When you found out that there was going to be leakage from these ponds, why did it concern you?

A I guess my biggest concern is that after my livestock eat these toxic grasses or something, possibly something may be produced from this, or drink this contaminated water and they die. This is affecting me personally. It's affecting every rancher in the country, because his livestock are dying. It also increases the amount of equity that my banker has in my outfit every time one of these cows dies.

Q Do you have any reason to believe that the material the companies are going to put into these ponds might be toxic?

A Yes, sir, the companies have testified to this. Portions of this material will be toxic, are toxic.

Q When you prepared this statement, were you aware that the companies were installing machinery called scrubbers or scrubbing systems?

A Yes, sir.

Q The purpose of which was to remove various pollutants from the gases so it wouldn't be spread by the smoke?

A Yes, sir.

Q And were you aware that these toxic materials were going into these ponds which Bechtel said might leak?

A Yes, sir; if they didn't go into the ponds, they were going to go into the air, or vice versa.

Q Has anything been brought to your attention since you prepared this press release to indicate that the material in there is not actual and factual, and do you still stand by it?

A Yes, sir, I do.

MR. GRAYBILL: That's all.

HEARINGS EXAMINER: Any re?

Redirect, by Applicants

By Mr. Peterson:

Q Mr. Coates, how far do you live from the ash disposal pond? How far do your cattle graze from those ponds?

A The closest one that I have is approximately a mile and a half.

Q Do you anticipate that your cattle are going to be grazing at the ponds, at the ash disposal ponds?

A I see nothing right at the present, no, sir, but I can see my neighbor's cattle grazing there.

Q And you think they'll be ingesting the sludge?

A It's possible, sir.

Q How will that occur?

A It's pretty hard to build a fence that will keep cattle out of it as far as the actual contact with it. Gates are left open, things of this nature. They may come in contact with the water, too.

MR. PETERSON: That's all I have, Mr. Davis. Thank you.

HEARINGS EXAMINER: Very well, you are excused, sir.

(WITNESS EXCUSED.)

HEARINGS EXAMINER: The next witness is being called as an adverse witness by the Applicants.

THOMAS M. FRANCE, having been subpoenaed as an adverse witness by the Applicants, and having been previously sworn upon his oath, was examined and testified as follows:

EXAMINATION OF THOMAS M. FRANCE

Direct, by Applicants:

By Mr. Peterson:

Q Your name is Thomas M. France, and you reside at 501 Sherwood in Missoula, Montana, is that correct?

A Yes, it is.

Q And you are staff representative or an employee of the Northern Plains Resource Council?

A Yes, I am.

Q And how long have you been employed by the Northern Plains Resource Council?

A I was employed by the council from May 1974 to August of 1975 and I've been working part-time for Northern Plains since the first of this year.

Q What have been your assignments with the council since the first of this year?

A I've been working with landowners that the council has developed a relationship with over the last two years in regard to the Colstrip to Hot Springs 500 kV transmission line.

Q How did they develop that relationship?

A When Montana Power Company and the other four applicants submitted the Colstrip proposal, there was an initial concern on the part of Northern Plains about the impacts of Colstrip and of the power lines, and through the early part of 1973, we began receiving a large amount of concern from members that we had, particularly in the Rosebud County area, and as knowledge of the application became more and more widespread, we began receiving letters and phone calls from landowners between Colstrip and Broadview that were concerned about right-of-way men that were approaching them to secure corridors for the Colstrip to Broadview line, and at that point, they were trying to secure a 300-foot right-of-way, which would have been sufficient for Colstrip 3 and 4 for the two 500-kV lines. This concern quickly spread westward, and over the course of the spring and summer of 1974, we began working more and more with landowers, trying to help them articulate their concerns about what the power lines would do to their ranching operations and what they would do to their communities. Eventually, we saw the affiliation of one landowners' group, the Central Yellowstone Landowners' Association, with the Northern Plains Resource Council, and we developed a close working relationship with the Broadview Landowners' Association and with other groups of ranchers and landowners across the state.

Q Did these ranchers and landowners contact the Northern Plains Resource Council?

A In many instances, they did, and in other instances, we actively contacted them.

Q Who has the council itself contacted?

A I'm not sure how to answer that question.

Q Do you know any names?

A I could give you a few. I'm certain I would miss some.

Q Give me some that you do remember.

MR. GRAYBILL: To which I object, unless the purpose is shown. I think he's testified in general, Mr. Hearings Officer, and if he just wants him to list names, I don't understand the purpose of that inquiry.

HEARINGS EXAMINER: What's the purpose of it?

MR. PETERSON: I just want to know who the council has, in fact, themselves contacted. The witness testified, I believe, that the impetus came from the ranchers and landowners. Now I find out that in many instances, they, themselves, contacted landowners along this transmission line route, and I'm now trying to find out the names of those people.

HEARINGS EXAMINER: Very well, the objection is overruled. You may answer, as to what you remember.

A I'd like to clarify first, what exactly did you mean by impetus?

Q Just give me the names of the individuals who the council itself contacted who own land along the preferred route.

A Well, I can't speak for the whole route.

Q Just give me the present knowledge that you have.

A All right, I contacted Mrs. Helen Stevens, of Thompson Falls, which is not, again, on the power company preferred corridor, but along the BPA section of the line. I became acquainted with Mrs. Stevens through another landowner up there who did contact the council and suggested that Mrs. Stevens would be interested. I contacted several landowners in the Ovando-Helmville area after a public meeting was held up there, sponsored by the Montana Committee for the Humanities. At the bar afterward, several landowners came to me and said, "Would you get hold of me?" I didn't know them at that point, but later on, I responded to their request, and we held several more meetings up in the area. The other instance that I dealt with was in Helena and the area between Townsend and say, Avon. I asked some people. We were interested in putting on a public information meeting over here, and I asked some people if some landowners would be interested in helping sponsor this meeting, and I became acquainted with Mr. Ed Grady, I think it is, of Canyon Creek, and Mr. Gil Warren, of Clancy, and we sat down one night and talked about the possibility of putting on a meeting, and they thought that it would be a very good idea. Mr. Grady was on one of the alternative corridors and very much interested in the line, and at that point, we were very much interested in presenting both sides of Colstrip issues. We invited representatives from the power company and had a meeting in Helena on, I believe it was, July 10th.

Q Of what year?

A Of 1974, which I attended, and a couple of other ranchers, a Mr. Bill Cook from Florence, and Mr. Bill Gillin, from Colstrip. Albert Tsao was invited to participate, as was Roger Hofacker, from the power company.

Q Were there any other individuals that you contacted for the council along the preferred route?

A Not that I recall right now. I'm certain that there have been many other people.

Q What is the Montana Committee for the Humanities?

A I'm afraid that's outside my field of expertise.

Q Are you a member of that committee?

A No. I think it's a federally-funded committee to promote the humanities.

Q Mr. France, did the staff, including yourself, prepare a letter to the landowners along the preferred corridor?

A We prepared several, sir.

Q I'm handing you Applicants' Exhibit 135 and I'll ask you if that was one of the several letters dated January 16, 1976?

A Yes, it was.

Q And where was that letter prepared?

A It was prepared in the Billings office of the Northern Plains Resource Council.

Q Was the substance of that letter prepared by yourself and Mr. Englund?

A Yes, sir.

Q Was it passed upon by anyone else on the staff of Northern Plains?

A I'm sure that most of the staff, and probably several of the board members, had input into it.

Q What was your understanding as to the format of the hearings that are presently in progress on Colstrip 3 and 4 with regard to testimony by public parties?

A I'm not sure that my understanding of the hearings -- that anyone that wished to testify under the Montana Utilities Siting Act is party to a utility siting decision and that in order to testify, they must attend the hearings here in Helena if they want their feelings to go onto the public record.

Q That was your understanding?

A Yes, sir.

Q Why is it, then, that in the exhibit that you wrote to the landowners, that the Montana Power Company,"if you're not present at the hearings, the Montana Power Company may object to having your letter incorporated into the official hearing record. In the past, the power company has objected regularly"?

A I don't see where there's any contradiction between that and what I just said.

Q Did you explain to the individuals that the ruling was made by the Hearing Examiner in this case, that the format was that the people had to attend and be subject to cross-examination if they wrote a letter?

MR. GRAYBILL: To which I object as not a correct characterization of the rule the Hearing Officer has laid down.

MR. PETERSON: I think it is.

MR. GRAYBILL: It's my understanding, Your Honor, that the rule is that if someone writes a letter, that letter may be offered; then either side may object to the letter; if there's no objection to the letter, the letter can go in the record; if there is objection, they have to be here in person and testify, or else the letter can't go in.

HEARINGS EXAMINER: Well, that rule was made at one time; basically, that was the rule, and then subsequent to that time, we haven't received any letters so that counsel have been present, and I've written all the people who gave letters, basically.

MR. GRAYBILL: Do I understand that the rule, as I enunciated it, has been changed?

HEARINGS EXAMINER: Well, it's been modified to the degree that everyone who has written me a letter that I've received, I've responded and explained the fact that the board was going to receive evidence on sworn testimony, and that I couldn't incorporate their letter in the record. They'd have to be present and available to testify.

MR. GRAYBILL: All right, that may be what you responded. I do recall very clearly the meeting we had in the office building downtown here, where the rule was enunciated that the letters would be displayed, and I do recall that the first letters, at least, were displayed, and I do recall that the Montana Power Company refused to allow certain letters to be put in the record as a matter of course when they were offered to them. I don't understand the purpose of the question. I don't believe that's what Mr. --

MR. PETERSON: Well, you've effectively testified now, Mr. Graybill, that you didn't understand the purpose of the question.

MR. GRAYBILL: Well, I'm challenging your interpretation of the rule.

HEARINGS EXAMINER: Well, I think he can answer the question and explain it if he wants. Mr. Sheridan, did you have something you wanted to say on that?

MR.SHERIDAN: I was going to say that my recollectio of events is as Mr. Graybill has related to you, for the purposes of the record.

Q On what occasions has the Montana Power Company Company constantly objected to the introduction of any letters into this record?

A I attended a good number of these hearings, either in this guise, or the guise of the Board of Health, over the period of my employment prior to my termination of employment with Northern Plains in the fall, and I can remember several occasions when either yourself or Mr. Bellingham objected to letters being put into the record, where the witness was not here to be cross-examined, and I think we could probably go back into the record and dig up the dates, but I can't give you the exact dates, but I do have recollections of that.

Q We will let the record speak for itself, then.

MR. GRAYBILL: I think that's a good idea, but I would like to point out that that conforms with my recollection.

MR. PETERSON: Well, the record will again speak for itself.

MR. GRAYBILL: I'd like to understand at this point, Mr. Hearing Examiner, whether Mr. Peterson is denying that he has refused to -- (Messrs. Graybill and Peterson speaking simultaneously, therefore unintelligible) -- because I don't want the record to be in a shape that it implies that he has not denied that, when I know the fact to be that he has.

MR. PETERSON: Mr. Graybill, the record will speak for itself.

Q Now, Mr. France, attached to the letter of January 16th was an admonition that if Colstrip 3 and 4 are approved, "this will happen to you." Who prepared that document?

A I would characterize this as a staff document that probably a number of people had input into. I didn't have anything to do with the actual writing of it. I did review it before it was printed.

Q In other words, your testimony is that the detail that is included in that attachment comes from the staff of the Northern Plains Resource Council?

A Well, the detail in it comes from numerous documents that we received concerning the nature of the Colstrip to Hot Springs 500 kV line, which started with our receiving a copy of the Westinghouse study, and which has been added to, in large measure, through these hearings. The writing in it comes from the staff.

Q How many landowners along the preferred route of transmission line have a railroad going through their land?

A I couldn't give you an exact number. The primary area where a railroad would affect landowners that are on the preferred corridor would be on the south fork of the Musselshell, and probably up into the Townsend region into Helena.

Q Is it the position of the Northern Plains Resource Council that the people who live west of Broadview, Montana, will have their life style affected by the construction of the plants at Colstrip?

A Yes, sir. Colstrip 3 and 4 can't be built unless the 500 kV lines are built in association with them, and two 500 kV lines, with their 300-foot corridor and all the other attendant things that accompany these lines, will affect, I think, by your own statement, along the preferred corridors, some 300 and some landowners. We keep referring to the preferred corridor here, and I don't think that that is necessarily any kind of factual basis to be talking about, since there's been no corridor recommended by the Department of Natural Resources, and at this point, we're talking about several corridors in which landowers may or may not be affected by the Colstrip to Hot Springs 500 kV line.

Q Well, I used the words, "preferred corridor," taking it from your letter of January 16th, Mr. France. Now, I want to know one other thing: how many landowers, of these 300 that you just cited, own agricultural land which will be affected by the transmission line?

A Again, I can't give you a specific number, but I would say the overwhelming majority.

Q Overwhelming majority of the 300?

A Easily, and as I said, the 300 is only -- just from your mosaic maps. I don't think it takes very much driving west of Broadview to realize that most of the land there could be characterized as agricultural. The only exception between Colstrip and Hot Springs might be the lines running through the south end of the Mission Mountains if the preferred corridor is approved; on the other hand, if some of the other alternative routes, as approved, give Colstrip as a selected corridor, you're going to get into a lot more residential property property, which helps.

Q What individuals have contacted your organization with regard to asking you to prepare their testimony to insure that they will be allowed the opportunity to testify?

A At this point in time, I don't think that it would be a fair characterization to say that any individual has contacted Northern Plains to prepare testimony. We've talked to a lot of landowners over the last couple of months who are interested in testifying. We've helped some of them with testimony with writing it. They come up with their own ideas. We help write it, much as the power company helps to prepare testimony for their witnesses.

Q Who would be the individuals on the staff of the Northern Plains Resource Council that would have the knowledge of the facts which are contained in the attachment to Applicant's Exhibit No. 135?

A What do you mean by knowledge?

Q Well, you have a lot of detail in there relative to the level space required for the crane to operate, the size of the crane. You state that each tower takes up a large amount of land, that the towers are guyed towers, that they are nuisances to the cattle; that they have brought access roads and water wells and water quality, and about the design being highly suspect, and about the railroads, and the final irony, the railroads going through most of the land. Who would be on the staff of Northern Plains who would have access to that knowledge?

A I'm a little curious as to what you mean by access. We all have access to that kind of knowledge.

Q Who would have been the person who put together the attachment?

A Probably the person you would want to talk to is Mr. Carl Englund.

Q He's the other author of this letter that you wrote on January 16th?

A Yes.

Q Now, is it your plan, or is it your duty or assignment on behalf of the council to continue these contacts with the landowners across the state of Montana?

A Again, I wouldn't characterize it as a duty. The council is made up of a fairly broad membership across the state, and the reason that we have a staff is to provide our membership with the kinds of access to knowledge like this particular document you're referring to and other matters that concern them in their livelihood. At this point, we consider it a responsibility, really, to maintain our communications with members.

Q And that's what you intend to do?

A Yes, sir.

Q Do you have access to a copy of this membership list included in the Northern Plains Resource Council, as a staff member?

A Yes.

Q Would you supply that to me, please?

A No, I will not. We've already gone through that.

MR. PETERSON: Mr. Davis, I'll ask that the witness be instructed --

MR. GRAYBILL: Just a minute --

MR. PETERSON: -- to supply a copy of the membership list he has available to him as an employee.

MR. GRAYBILL: Now, Mr. Davis, on that issue, that was the subject of an interrogatory filed, I believe, about February 20th or February 23rd, by the power company. At that time, that interrogatory was -- an issue was made before the then hearing officer -- as to whether that interrogatory had to be answered. It was made clear, that while -- and we did give them an interrogatory form and the number and character of the members, in terms of their percentage of rural and city, and that sort of thing -- there was a great deal that we refused to give them -- a list of the names of the membership -- on the grounds that it would serve no useful purpose in this hearing;was intended to get into the hands of the power company, the list of these people that could be written to and harassed. Now, I see no purpose in ordering this witness to give a list of the membership. In the first place, I'm not at all sure that he's capable of producing such a list. We would certainly, on behalf of Northern Plains, resist such a list, resist the giving of a membership list. It doesn't seem to me that that has any relevance except as to encumber the record, make the record more costly, put before the board members a giant number of names -- because we've already admitted that there are something over 900 members and a number of other members in associated organizations. I see no point in listing 900 names in an appendix to the record here. I think it's clear that the power company's attempt to get this list of names is not associated with proving their case that the power plant should be built and that the transmission lines are viable, but rather, to stifle or harm people who honestly and sincerely oppose those programs.

MR. PETERSON: Mr. Davis, with regard to beleaguring the record, or encumbering the record, Mr. Graybill has made, I don't know how many requests of us for documents and data and so forth, a lot of which was never introduced into evidence, and which was given him for the purpose of examination to see whether or not it was relevant, or what purpose it did have, including studies back on rape cases and everything else, and all of that material was supplied. It isn't our intention to at this time make an offer unless we can feel it might be relevant to test the credibility of some witnesses, and that is the purpose for which we seek the list, as being a public body, as I understand it, who is interested in Montana, and I can't understand how anybody would want to make their activities secret.

HEARINGS EXAMINER: Very well, I understand you've both made your arguments. Is that in the form of a motion, Mr. Peterson?

MR. PETERSON: Yes, sir.

HEARINGS EXAMINER: Very well, the motion is denied. You don't have to pursue it further.

MR. GRAYBILL: Mr. Hearings Officer, so that the record is complete at this point, I'd like the record to show that the Hearing Officer previously ruled on this same --

HEARINGS EXAMINER: I've already ruled on your motions, so there's no use going into the fact of justifying my ruling. I think that does encumber the record.

MR. GRAYBILL: I do think it's necessary that we know that page 5408 is where we can find the other reference, Your Honor.

HEARINGS EXAMINER: I don't know the page, but I'm aware of what it is. I denied the motion.

MR. PETERSON: We move into evidence Applicants' Exhibit 135.

HEARINGS EXAMINER: Any objections, Mr. Graybill?

MR. GRAYBILL: No objection.

HEARINGS EXAMINER: What's the number of that, 235?

MR. PETERSON: Excuse me, 235.

HEARINGS EXAMINER: Let's settle for 235. Any objections?

MR. GRAYBILL: No objections.

HEARINGS EXAMINER: Very well,Applicants' No. 235 is hereby admitted. Do you have any further questions, Mr. Peterson?

MR. PETERSON: No.

HEARINGS EXAMINER: Mr. Graybill.

Cross, by Northern Plains Resource Council

By Mr. Graybill:

Q Mr. France, in your cross-examination as an adverse witness by Mr. Peterson, he asked you some questions about how the Northern

Plains became interested in this, and you mentioned that you'd had landowners who had brought in letters to you concerning things that happened to them in letters that they'd received from the power company and others, concerning the right-of-way for these transmission lines. I have shown you what has been marked for identification as Northern Plains Resource Council Exhibit No. 5. Do you recognize that as the type of letter that was sent to the Northern Plains Resource Council by landowners along the proposed transmission lines?

A Yes, I do.

Q Letters like this were sent to the Northern Plains to illustrate the manner in which people were being asked to sign easements for right-of-way, is that the idea?

A Letters, and in most instances, I would say, a personal recounting of incidents with power company right-of-way people.

Q From whom did the letter come, this proposed Exhibit No. 5?

A I believe that came from Mr. and Mrs. Carlyle.

Q That's to whom it was addressed, isn't it?

A Yes, and that's whom we got the letter from.

Q I see, and who sent it to them?

A Mr. Dale Heston, of Universal Field Services, who at that time -- I'm not sure whether they're still employed by the power company -- was securing right-of-way for Montana Power -- again, at that time, it was the Colstrip to Hot Springs line, and that was later changed through legislative law to restrict them to acquiring right-of-way.

Q Do you know that the Universal Field Services people were an agent for the Montana Power and the other applicants here in securing right-of-way between Colstrip and Broadview?

A Yes.

Q And is the right-of-way they secured for 230 convertible to 500 kV power lines that would be used in association with both Colstrip 1 and 2 and 3 and 4?

A I don't believe all the right-of-way is secured. Some of it has been.

Q In other words, it's part of the project that involves Colstrip 3 and 4, isn't it?

A Yes, certainly.

Q In considering the interest of Northern Plains in concerning itself with these landowners' rights that you described to Mr. Peterson, did you become aware of the material contained in the third to the last paragraph, or possibly the fourth to the last, whichever one I illustrated there? Were you aware of that paragraph?

A We became rather intimately aware of that, the more landowners we talked to.

Q What is the point of that paragraph as concerns the relationship of the landowners along this line with the applicants here?

A The point, I guess I would say, is fear. It's a threat of condemnation if the landowner doesn't come to terms with the power company for right-of-way.

Q In other words, the letter amounts to a notification to the landowner that his land may be condemned by these parties if he doesn't agree?

A Well, in this letter from Mr. Heston to the Carlyles --

Q Why don't you just read that into the record?

A I was going to.

MR. PETERSON: I'll object to that. The letter is the best evidence.

HEARINGS EXAMINER: The letter is not in evidence.

MR. GRAYBILL: All right, I'll offer the letter.

MR. PETERSON: May I voir dire?

HEARINGS EXAMINER: Certainly.

Voir Dire by Applicants

By Mr. Peterson:

Q Now, Mr. France, the letter, Exhibit No. 5, is a letter addressed to some people by the name of Carlyle from another source, is that right? Where is the letter from Carlyle to Northern Plains Resource Council?

A I guess I would say I hope that's in our files.

MR. PETERSON: I'll make a motion that that letter, and all other letters addressed to the Northern Plains Resource Council by the landowners be produced so that we may have the benefit of those letters, and also I'll object to this, that it's an incomplete document.

MR. GRAYBILL: So that the Hearings Officer may have a better opportunity to rule on that, the record may show that the Carlyles contacted Northern Plains Resource by telephone and then sent this letter to them after the telephone conversation.

MR. PETERSON: Well, are you under oath now, Mr. Graybill, or are you just trying to correct the --

MR. GRAYBILL: No, I'm just trying to let you understand -- you've made an objection that assumes a series of circumstances.

MR. PETERSON: No, I just asked your witness whether the letter was in his files, and he said, "I sure hope it is."

MR. GRAYBILL: All right, and then you asked him to produce it, and I'm telling you that we'll produce any letters, but that there aren't any letters, because they just sent it in after a telephone conversation.

MR. PETERSON: As I understand it, then, you will produce all the letters written to the Northern Plains Resource Council by the landowners along this route?

MR. GRAYBILL: No, that's not what I said -- by the Carlyles.

MR. PETERSON: Mr. Davis, you can rule on this.

HEARINGS EXAMINER: All right, your motion to produce is denied, and the objections to the admission of the letter are sustained. The letter is not admitted.

WITNESS: Then should I read this paragraph?

MR. GRAYBILL: No, wait a minute. Mr. Hearings Examiner, I'd like to understand the basis of your ruling. It's my understanding that Mr. Peterson asked how they became acquainted with these problems that the landowners were having and that the witness said that they got a lot of letters that illustrated problems, and we have now produced one of them, and you're going to say that we can't put that letter in the record?

HEARINGS EXAMINER: The testimony is that the Northern Plains received letters from the landowners. If you have a letter from the landowner, I will consider that. I'm not saying that I would admit it, but this is not a letter, as I understand the testimony, addressed from a landowner to the Northern Plains Resource Council. This is a letter which is entirely different.

MR. GRAYBILL: It's a letter -- well, let me ask another question or two.

Cross, by Northern Plains Resource Council

By Mr. Graybill (continuing):

Q Mr. France, isn't this a letter addressed from the agents for the applicants to a landowner along the route?

A Yes.

Q And isn't it a landowner along the route that Northern Plains Resource Council's staff, including yourself, have had some contact with?

A Yes.

Q And the sort of contact that Mr. Peterson was asking you if you had with the landowners?

A Yes, indeed.

Q And doesn't the letter represent a document that the landowners with whom you had contact gave to you as an example of what was causing them to seek out the Northern Plains Resource Council?

A Yes.

Q And did these landowners, the Carlyles, in seeking you out, deliver, to the Northern Plains Resource Council, a letter showing what it was that the power company had done that caused them to have contact with the Northern Plains Resource Council?

A Yes.

Q And is that letter a photostat of the document that they delivered to so show?

A Yes, it is.

MR. GRAYBILL: I would offer again Exhibit No. 5 in evidence.

MR. PETERSON: Well, I'll object further that it's irrelevant and there is certainly no proper foundation relative to when it was received, by whom, and how, and again, it does not constitute a letter from the landowner to Northern Plains Resource Council.

HEARINGS EXAMINER: Very well, I think the point you have made is that Mr. France is under oath and he's testified that he was solicited by landowners, that Northern Plains was, and I think that's well-established, but as far as admitting letters in evidence over objection at this hearing for this purpose, I'm going to sustain the objection, and not let it in.

Q All right, Mr. France, let me ask you this. Did the Carlyles, as well as other landowners along the line, the transmission line route, complain to Northern Plains Resource Council that they'd been threatened with condemnation if they didn't sign easements?

A Yes.

MR. PETERSON: To which I'll object -- wait a minute -- move to strike the answer for the purpose of an objection.

HEARINGS EXAMINER: The answer will be stricken; now you can make your objection.

MR. PETERSON: I'll object that it's beyond the scope of direct examination and I'll further object on the ground that it's irrelevant.

HEARINGS EXAMINER: Overruled; you can answer that question.

A The Northern Plains was contacted by landowners in several instances, who were concerned about threats that they had had -- threats may be too harsh a term, but notification that they had received from the field service personnel of Universal Field Services, that they would be subject to condemnation if they did not sign an easement for the Colstrip to Broadview line.

Q And is that one of the reasons that you and the other staff members of Northern Plains concerned yourself with the transmission line problem?

A Yes. I don't think you could look at a transmission line without becoming involved in right-of-way acquisition and with what follows that, and that's condemnation.

Q All right, now, Mr. France, there was some examination by Mr. Peterson that I didn't understand, when he asked you if the landowners that you'd contacted -- how many of them owned agricultural land. Don't you consider range land as agricultural land?

A Certainly.

Q And don't you consider forest land, with trees growing on it as agricultural land?

A I might draw some kind of fine line there, but certainly, it's a productive product of the land.

Q So what you intended to say distinguished agricultural land from, say city land, or non-productive land, is that the idea?

MR. PETERSON: Objection; leading and suggestive.

HEARINGS EXAMINER: Overruled. You may answer.

A I'm not sure of your question, but virtually the entire route of the Colstrip to Hot Springs line, whichever corridor you wish to consider, goes through productive land of some sort.

Q And in that sense, it's agricultural land?

A Yes, in that sense, it's definitely agricultural land.

Q Now, Mr. France, in conjunction with the little flyer called "If Colstrip 3 and 4 are approved, this will happen to you," which is included as a part of Applicants' Exhibit No. 235, Mr. Peterson asked you specifically about a paragraph on the second page of that that says something about the design of the towers as suspect. Do you have any knowledge that there has been difficulty in the tower program of the applicant companies?

A I certainly do.

Q What is your knowledge about that?

A There's a whole series of memos from Charles T. Main to various people involved with the Colstrip project over the late summer and fall of 1974 concerning structural design problems that they were having with the steel towers required for the Colstrip to Hot Springs -- at that point, the Colstrip to

Broadview 500 kV transmission line.

Q I take it you studied those memos?

A Yes, I read them all.

Q And I take it from your study of those memos, you're aware that there were tower failures in the test program?

A Yes.

Q Do you know personally of any tower failures after the test program and during the construction of this line?

A I know at least one tower that collapsed before the lines were strung.

Q You mean a steel tower that collapsed?

A Yes, sir.

Q That was put up on some landowner's land?

A It was put up in his wheat field and it fell down in his wheat field.

Q And is that the sort of structural design failure that you think this memorandum is referring to?

A I suspect that it might be exactly that. The memo seemed to refer to once the lines were strung, but this one seemed to have fallen apart before the conductors were put up.

MR. GRAYBILL: All right, I think that's all.

Redirect, by Applicants

By Mr. Peterson:

Q Were you present when that tower collapsed?

A No, I wasn't.

Q Where did it collapse?

A I believe it was east of Broadview.

Q What was the cause?

A I do not know that. I do not know that specifically, but I suspect that it related to the memos from Einar Greve, formerly with Charles T. Main, concerning structural design problems with the tower designs being used for the Colstrip power line.

Q You don't know whether or not it was even a test itself in the field relative to the structural strength of the tower, do you?

A I guess I don't. It seems like an odd time to start testing lines and towers when you're building them in the field, though, particularly in late fall.

Q Are you a structural engineer?

A No.

Q How many lines have you built?

A We both know that I haven't built any.

Q Right. Now, Mr. France, do you believe in the Constitution of the state of Montana?

MR. GRAYBILL: To which I object, as asking something of this witness which has no bearing on this case. We don't need to get into his political beliefs in order to solve this case.

HEARINGS EXAMINER: What's the purpose of that question?

MR. PETERSON: Well, I believe he testified that it was a very difficult thing for these landowners to be given the option, I guess, that they had the right of condemnation, the power company has the right of condemnation.

HEARINGS EXAMINER: Is your question on the constitution, then, relative to condemnation?

MR. PETERSON: Right.

HEARINGS EXAMINER: All right, overruled; you may answer.

A Yes, I think the Constitution of the state of Montana is a fine document.

HEARINGS EXAMINER: Thank you, Mr. France.

MR. PETERSON: Mr. France, Mr. Davis was one of those who wrote that document. Mr. Graybill was, too. And you know that Mr. Davis and Mr. Graybill wouldn't put anything in that document that wasn't for the public good?

WITNESS: I hope not.

MR. GRAYBILL: Let the record show that everything in there, Mr. Davis and Mr. Graybill didn't put in, though.

Q And if they put in a provision giving the power company the right of eminent domain, because of the public good, you'd subscribe to that, wouldn't you?

HEARINGS EXAMINER: That's a tough one, isn't it?

A I might question as to how eminent domain has been used in the state. I certainly wouldn't question the fact that in some instances it is, indeed, a public good.

MR. PETERSON: That's all I have.

Re-cross, by Northern Plains Resource Council

By Mr. Graybill:

Q Mr. France, I know you're not a lawyer, but do you know whether or not the Constitution expressly gives the power companies the right of eminent domain?

A I believe that the Constitution gives the state the right of eminent domain and then the state, through legislation, gives that power to certain public utilities that are acting, supposedly, in the public good. I don't think that this is an instance of that, no.

Q You mean it isn't, in your opinion, in this instance, a public good?

A No.

Q Well, I'm glad you explained to Mr. Peterson how it works.

HEARINGS EXAMINER: Anything else? I want to know if the Applicants, with the conclusion of this witness, are in a position to rest their case.

MR. PETERSON: I would again make a motion that we be supplied with a copy of the correspondence that has been mailed to the Northern Plains Resource Council by landowners along this route.

HEARINGS EXAMINER: Motion denied.

MR. PETERSON: I have two more witnesses I'd like to put on.

HEARINGS EXAMINER: If you have any further witnesses, do you want to rest? I'm not insisting that you do, but this is some semblance of order at the conclusion of the day.

MR. PETERSON: Well, it's too late in the day to rest.

HEARING EXAMINER: All right, then we'll recess, and I think we'll --

MR. GRAYBILL: Wait a minute, wait a minute. I do have a couple of things I'd like to get on the record before we recess. May I have a moment?

HEARINGS EXAMINER: Yes, you may.

MR. GRAYBILL: All right, first on scheduling, I'd like the record to show that Northern Plains Resource Council has today delivered ten statements to the Applicants and to the other principal parties, as well as to the Hearing Officer, from its witnesses. It has also delivered to each of these people and the Hearing Officer a new, revised witness list. That witness list may not be finally complete, but as changes occur, I will be glad to notify the Hearing Officer. I think the record may show, but I wasn't present in the room when it was put on, but the Northern Plains Resource Council is now scheduled to begin its case on or after March 1st, 1976, and I think it's the intention of the Hearing Officer, as I understand it, that if there's a day or two in there that isn't filled, that we nevertheless would have the right to start on that day and not earlier than that so I can prepare my witnesses. Is that correct, sir?

HEARINGS EXAMINER: That's correct. I don't anticipate you will have to put on any witnesses until commencing at 1:00 o'clock Monday, March 1st.

MR. PETERSON: Well, I am really confused now, because you just ruled a couple of hours ago, as I understood it, in answer to my specific question, that the Northern Cheyenne Tribe is going to follow the Department of Natural Resources, and that they were to commence on March the 1st at 1:00 o'clock.

HEARINGS EXAMINER: If I stated that, I was in error. I was referring to the Northern Plains and stated that hopefully, perhaps, the Northern Cheyenne could come on the latter part of next week.

MR. PETERSON: I want the Hearing Officer to know at this time that the fact that we've been served with these statements at this date and with a long list of witnesses, does not mean that we may be prepared to cross-examine these witnesses on March the 1st, because we have other duties that we're going to be undertaking next week in cross-examination, and the time constraints may not give us the ability to prepare adequately for cross-examination of those witnesses.

HEARINGS EXAMINER: I think that's understood, and has been throughout this, that we've had some flexibility extended all counsel on cross if you don't have time to prepare, but we would like to shoot for that goal, if possible.

MR. GRAYBILL: Mr. Peterson, the record should also show that by stating that Northern Plains hopes to start on March 1st, I in no way intend to interfere or get ahead of the Northern Cheyenne Tribe, which I presume will come ahead of me, as it does in the normal order, but I merely am trying to assure myself that my witnesses don't have to be ready before March 1st. That's the point, and they certainly can be pushed further backward.

HEARINGS EXAMINER: And also, the further reservation is, we may not be through with the DNR and Health and so far at that point, so we'll keep it in order, but I'd like to shoot for some sort of a time.

MR. GRAYBILL: In line with that, Mr. Peterson, I'd like to notify you and have the record show that the Northern Plains Resource Council intends to have available on one day or one day and the next day, if it's necessary, a number of witnesses associated with the transmission facilities only, in other words, the 500 kV lines, rather than the plant, and those farmer-rancher witnesses who we intend to call in conjunction with the transmission lines, some of whom you have the statements for already, we expect to call on a day certain, namely, Wednesday, March 3rd, and we have cleared with the Northern Cheyenne Tribe that if they happen to be not finished, they would allow us to put those witnesses on that day so that we can notify these ranchers of a day that they can come, and I'm certainly aware that constraints happen and we might not finish them or anything, but on March 3rd, it's our intention that falling within the time that normally would be ours, if the hearing goes as we all anticipate, to have those witnesses on that day, the same as you've shown us, and the DNR, when there are people who have to be here on certain days, we try to schedule them for that, so that's our landowners' day. Mr. Hearing Officer, there are two procedural matters that I would like to clear up. The first is that I understand that either yesterday or Friday, you ruled -- and I don't know whether it was a new rule or whether it was an application of an old rule -- but you ruled that when public witnesses appear in the hearing room and want to put their statements on the record, they would be allowed to do so after the completion of the then witness and before the next regularly called witness. I understand that was what happened. Is that right?

HEARINGS EXAMINER: Not exactly. I could give you a complete review, but I won't at this time.

MR. GRAYBILL: Can you give me a summary?

HEARINGS EXAMINER: The summary of the situation, Mr. Graybill, was that in order to press along, the DNR felt that they could start with their case last week, and the order of procedure that we had was that we'd have the public witnesses in support of the proponents follow their case in chief and the same with the opponents. Schedule-wise, I had received letters from some 20 or 30 witnesses, both pro and con, so I tried to schedule them. I projected this in my mind as best I could and wrote them that we'd start the 17th with them, when we adjourned on or about the 2nd of February; then, after we reconvened, it appeared that we were going to get along a little quicker and we decided we'd try to push all those public witnesses in that we could and give them first priority as much as possible, since it was still part of the proponent's case in chief, which we did. Then we moved up and we got quite a few public witnesses in last week and we've got some more this week, and I have two or three that have written in and we've told them they could come in on the 19th, so it's been modified to that extent, and I think it's not a bad rule, and I think we ought to keep it in mind if we can, but as far as your opponents' public witnesses are concerned, I'm not of a mind to take a lot of opponents' public witnesses out of order; in other words, it might disrupt the DNR case, if that's what you have in mind or are thinking about; in other words, if tomorrow you wanted to run in ten public witnesses and they've got a lot of their experts -- we did it as far as the other case, and I think it would be a good idea as far as this case is concerned, but with some constraints on it.

MR. GRAYBILL: What really concerns me, Mr. Hearing Examiner, what is the rule now? Have you rested your case in chief?

MR. PETERSON: We will in the morning.

MR. GRAYBILL: After they rest their case in chief, may they still interrupt the DNR's case and maybe our case by bringing in --

HEARINGS EXAMINER: Absolutely. The public witnesses are part of their case in chief under the schedule, as I understand it. You put in your case in chief and then public witnesses in support come in subsequent to that time.

MR. GRAYBILL: What I mean is, can the opponents continue to bring public parties opponent in throughout my case and throughout the DNR's case, at any time? That really concerns me, sir, because I really believe they're being recruited, and I don't like that.

MR. PETERSON: We'll object to that characterization.

HEARINGS EXAMINER: I'm not going to make any fast rule on that, because my feeling is this: if some citizen of the state of Montana wants to come in, as these people have, and wants to testify at this public hearing, I'm going to take a hard look at turning them down on either side of this issue. I'm assuming now that most of the public witnesses I have any knowledge of have pretty well testified. I have about eight more that have indicated they're going to come.

MR. SHERIDAN: At this point, might we defer the remaining public witnesses who have not indicated they wanted to come this week, to next week? I'm somewhat concerned with the number of expert witnesses that we have on tap who are traveling here, from an expense standpoint. It is disrupting the presentation of our case at this moment.

HEARINGS EXAMINER: In that regard, to keep the thing in order, it was my suggestion that we don't start the public witnesses until this week in support of it, and it was at the DNR's request that we pushed the thing up. We got out of order, but I think we got a lot done. We've taken over 30 or some public witnesses. There are some left, of course, but I think that should wind them up.

MR. SHERIDAN: I'm in favor of that too, but the point I'm making is that we now have some of our witnesses bottled up, and if we can discourage additional people coming this week and encourage them to come the first part of next week, we might be better off, rather than keep these experts over the weekend.

HEARINGS EXAMINER: On the letter I wrote, I reviewed that with Mr. Shenker, and he asked me if I would try to defer any of them until after Wednesday, and to each letter I responded, I asked them if they would try to come in, and the only ones left, I think have indicated they would come the 19th, so that's all I really know on it, but I'd rather not make an inflexible rule at this time. If there's any indication of recruiting, we'll cross that bridge when we come to it.

MR. GRAYBILL: Mr. Hearing Examiner, I certainly want the public witnesses to have access. The problem is interruption, and I'm sorry to have to say that we are absolutely aware that Mr. George O'Connor, who we all know is associated with the Applicants, has been recruiting among the REA co-ops to get people to come and testify and that in our judgment, he is probably still recruiting, and I think you may anticipate more requests, and I'm not saying he can't do that, but if we have a rule that he can recruit and they can get on at any time, I merely want that rule firmly established, because I intend to have some people on at other times, and I want the same right when my turn comes, if that's what he's going to do. I'm sorry, sir, but I think there is just exactly what you described going on.

HEARINGS EXAMINER: Well, I'm sure that works all the way around. I think we're at the stage now, basically, where that will be pretty much between the parties opponent, and it would be my view, as I think I explained here before, that hopefully, the parties -- and actually, last summer, when people asked when they could come in, I did write and tell them, Mr. Graybill, to try to keep in touch with the press, and if they were a proponent, with the proponents, and an opponent, with the opponent, because I thought the case would go much better if they coordinated their timing with your cases.

MR. GRAYBILL: I certainly agree with that, and all I'm saying is that I think you would agree with us that those of us on the opponents' side have not, you know, recruited a lot of people to come in and try to get their testimony in, in the middle of the proponents' case. We haven't put those people on then, and it does tend to interrupt us when, as on Friday, a group of plumbers,or whatever they were, came in and wanted to get on -- I think that's an unfair interruption. I certainly don't want to keep them out, but I think we ought to have some reasonable rule.

HEARINGS EXAMINER: It wasn't on Friday, because on Friday, my scheduling was that all these witnesses would follow the proponents' case and we'd defer starting your case until we got that job done, but as it was, we were able to take some testimony from DNR and go ahead and work it in. Let's try to keep working it in.

MR. GRAYBILL: All right, that's agreeable with me, Your Honor. The last point I'd like to make is that I did make an extensive objection to not being allowed to cross-examine DNR witnesses during the Board of Health hearing, and I would like at this point to reiterate that objection. I understand what the Hearing Officer's ruling will be, and I just want the record clear that I claim the same right here and that I want the same right shown in the record for this portion of the hearing as for the other portion.

HEARINGS EXAMINER: I think it's well that it goes in the record in this regard, and when Mr. Meloy made his request, I denied it without any further explanation, becase that witness on the stand had to catch a plane, but I do think that his motion to make the record clear was to the effect that he would have a right to cross-examine the DNR witness, and I'm not too sure the board would understand it just the way it sits, so my ruling is and has been that opponents, as I consider all the people who oppose the application, cannot cross-examine each other's witnesses, and I think it should be in this record.

MR. GRAYBILL: I understand the ruling, and that's fine. It's on the record.

HEARINGS EXAMINER: Very well, we will recess until 9:00 o'clock in the morning.

(HEARING RECESSED AT 6:28 P.M.)